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THE TREATMENT OF PELLAGRA

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It has been known for a long time that pellagra is characterized by remissions and relapses and that the mild cases promptly improve after the assimilation of an adequate diet. Goldberger and his co-workers,[1] have produced, prevented and sometimes cured pellagra and have recommended yeast as a specific therapeutic agent.[1a] Many diets, drugs and minerals have been advocated by others as certain cures for the disease.[2] In spite of the application of these recommended methods of treatment, all workers agree that the prognosis is very grave for the severely ill pellagrin and that the mortality rate in the advanced stages of the disease is extremely high. It was shown in a previous publication[3] that the mortality rate in a series of seventy-three cases of pellagra was 54 per cent, despite the fact that all of the patients were given hospital care and offered a highly nutritious diet, usually supplemented by yeast. This high death rate is in keeping with that of other hospitals admitting the severely ill.[4] In contrast to the mortality rate of 54 per cent described in the previous series of seventy-three pellagrins, the mortality rate has been reduced to 6 per cent in a second series of 125 severely ill[5] by means of the therapeutic measure described in the present communication. The cause of death of each patient in the present series of 125 cases was due, at least in part, to a coexisting disease condition.

It is my purpose in this paper to describe a method of treatment that was found highly successful in the management of the 125 cases of severe pellagra, admitted to a clinic for the study of that disease. For four months preceding the formation of this clinic the patients with severe central nervous system involvement, persisting vomiting and intractable diarrhea had been treated in the usual recommended manner, but under this treatment the disease progressed and the patient died. By this time methods had been found that were effective in treating the somewhat less severely diseased pellagrin. These methods were then applied to all patients in order to decrease, if possible, the mortality rate of the entire series of severe cases.

The successful treatment of pellagra is governed by the rigid application of certain general and specific therapeutic measures. They are so interwoven in the care of the patient that success depends on the effectiveness of both. In order to make the specific measures more effective, the following general ones must be carried out:

GENERAL PRINCIPLES OF TREATMENT

In the first place, adequate professional and nursing care are essential. All patients with pellagra must have sufficient rest and those who are severely ill must be confined to bed until their improvement warrants additional freedom. Large doses of sedatives are often necessary to accomplish this, but under no condition should they be given in amounts large enough to interfere with the patient's cooperation over long periods of time. Secondly, professional care is essential in order that the pellagrin may receive a well balanced diet containing 4,000 calories or more each day. In the most severely diseased patients the physician must supervise every detail of food intake to make sure that an adequate diet is utilized. It is often necessary for him to cooperate with and instruct the attending nurse and dietitian to see that the food is given in proper amounts at specified times. The physician must see the patient often so that the amount of food lost through vomiting or diarrhea may be evaluated and corresponding additional amounts given. Good nursing care conserves the patient's strength, thus making it possible for him to obtain more rest, which helps promote the effective use of ingested food. Adequate professional and nursing care are also necessary in the local treatment of the lesions, which often makes the patient feel more comfortable and for that reason is desirable, though not necessary in effecting the cure. It need not be said that coexisting diseases must be treated as well as the pellagrous condition itself.

SPECIFIC THERAPEUTIC AGENTS

1. *Yeast.*—This material is highly efficacious in the treatment of many cases of pellagra and can be given to mildly and moderately diseased pellagrins. Many of them refuse to take yeast, however, because of its

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1. (a) Goldberger, Joseph; Wheeler, G. A., and Sydenstricker, Edgar: Relation of Diet to Pellagra, Pub. Health Rep. 35:648 (March 16) 1920. (b) Goldberger, Joseph, and Wheeler, G. A.: Experimental Pellagra in the Human Subject, ibid. 35:1544 (July 2) 1920. (c) Goldberger, Joseph, and Wheeler, G. A.: Pellagra Control Investigations in Cotton Mill Communities, South. M. J. 13:208 (March) 1920. (d) Goldberger, Joseph, and Wheeler, G. A.: Pellagra Prevention, ibid. 13:214 (March) 1920. (e) Goldberger, Joseph; Wheeler, G. A.; Lillie, R. D., and Rogers, L. L.: A Further Study of Butter, Fresh Meat and Yeast as Pellagra Preventives with Observations on the Relation of Factor P-P to Pellagra, Pub. Health Rep. (Reprint No. 1164) 41:297 (Feb. 12) 1926.

1a. Goldberger, J.: A Discussion of the Therapy of Pellagra, M. J. & Rec. 118:513 (Dec. 5) 1923. Wheeler, G. A.: Address on Pellagra: Report of 100 Cases, paper read before the American Dermatological Association, Journal Lancet, Minneapolis, 43:1 (Jan.) 1923. Spies, T. D., and Pelligra, P.: Pellagra, Ill. M. J. 46:22 (July) 1924. Spies, T. D., and Pelligra, P.: Pellagra, South. Surgery, Gynec. & Obst. 36:1 (Feb.) 1924.

2. Spies, T. D., and Pelligra, P.: Observations on Etiological Relationship of Severe Alimentary to Pellagra, Am. J. M. Sc. 189:181 (Feb.) 1935.

3. Pellagra Commission: Pellagra in Illinois, Arch. Int. Med. 30:123 (Aug.) 1922. Siler, G. H.: Pellagra, Philadelphia, W. B. Saunders Company, 1912, p. 124.

4. Each examination of a severely ill pellagrin was entered in both series on a separate case. The incidence of recurrence in the first series was 10 per cent, as compared with 27 per cent in the second group. When the recurrences and complicated or separate cases and deaths in the first hospital admission combined, the percentage of deaths in both studies would have been lower. (It is well known that the pellagrin becomes weak with each recurrence of the disease.)

disagreeable odor and taste, and some learn that it predisposes to vomiting and diarrhea and consequently refuse it. When given in adequate amounts, averaging from 75 to 100 Gm. of the dry powder daily, it promotes a desire for food, a feeling of well being, and healing of the lesions. Patients tolerate it best when it is given in doses of from 10 to 20 Gm. at intervals of from three to four hours in a glass of either iced milk or iced eggnog until the required daily dose is administered. It is advisable to discontinue yeast therapy when persistent vomiting or intractable diarrhea develops. If the patient already has these symptoms, some other specific curative substance should have preference. On the other hand, if none of the other specific therapeutic agents are available, frequent small doses of yeast should be given, as it is likely that some of the material will be retained until the disease has improved or other therapeutic agents have been obtained.

2. *Desiccated Hog Stomach (Ventriculin).*—This complex substance is composed of defatted, desiccated walls of pig's stomach and has been shown by Sturgis and Isaacs[6] and Sharp[7] to be effective in the treatment of pernicious anemia. The indications for its use in the treatment of pellagra are the same as those for the use of yeast and, when given in adequate amounts, elicits a similar response. Desiccated hog stomach has the advantage of being somewhat less distasteful than yeast and does not have the laxative properties. As with the administration of yeast, patients take desiccated hog stomach best when it is given in doses of 20 Gm., well stirred into 200 cc. of iced milk or eggnog at intervals of three or four hours until the full dose of 200 Gm. or so daily is taken.

3. *Wheat Germ.*—This substance is also efficacious in the treatment of pellagra and should be given in amounts ranging from 250 to 300 Gm. daily. It is palatable and does not provoke vomiting or diarrhea to the extent that yeast does. In general, the indications for its use are the same as those for desiccated hog stomach.

4. *Liver Extract.*—This substance may be given orally or parenterally.

The oral administration of from 75 to 100 Gm. of liver extract each day rapidly cures the great majority of patients with pellagra. This preparation is highly palatable and may be given in the same manner as yeast or desiccated hog stomach. It is always a useful supplement to the daily diet of the pellagrin and usually does not cause diarrhea or provoke vomiting.

The parenteral liver extract should be used whenever the patient is dangerously ill. Frequent injections of large amounts of parenteral liver extract are indicated in all patients with persistent vomiting, intractable diarrhea and severe stomatitis. Although these symptoms can often be treated satisfactorily according to the general principles of the care of the patient and by the use of other specific therapeutic agents, the injection of adequate amounts of parenteral liver extract definitely shortens the convalescence and at times proves to be a life saving measure. When liver extract is administered intravenously, it should be given daily in from three to five doses of 20 cc. each. This treatment must be continued until the patient shows definite improvement and is able to take sufficient food supplemented by yeast, desiccated hog stomach, wheat germ or oral liver extract to insure uneventful convalescence.

The specific treatment of pellagra is most successful when one resorts to the parenteral injection of liver extract and the simultaneous administration of large amounts of special antipellagric materials by mouth. In the treatment of pellagra the choice of any one of the therapeutic agents should be based on the advisability of the material, the severity of the disease, and the ability of the patient to cooperate. All agents must be given in large amounts in order to remit the disease quickly, and in every instance the general principles for treating pellagra must be rigidly applied.

TREATMENT OF SPECIAL SYMPTOMS

1. *Stomatitis and Glossitis.*—More than 50 per cent of the patients with severe pellagra have glossitis and stomatitis. Often the patient refuses to eat because of the painful process of chewing and swallowing food. The physician and patient must realize that the tremendous swelling and reddening of the mucous membranes and tongue will in all instances quickly subside following the assimilation of an adequate amount of a specific therapeutic agent. Mouth washes make the patient feel better and for that reason should be used several times each day. Practically all patients with severe pellagra of the oral cavity have a secondary but extensive infection with Vincent's organisms,[8] and at times the inexperienced observer fails to recognize the underlying pellagrous condition with the result that antipellagric treatment is not begun immediately and the condition progresses. The teeth should be brushed gently, since severe hemorrhages often occur. Regardless of how severely involved the mucous membranes and tongue become, if the patient can and will take an adequate diet the lesions will usually disappear. The lack of improvement or the progression of the oral changes definitely indicates inadequate or improper treatment.

2. *Diarrhea.*—About 60 per cent of the patients with severe pellagra have marked diarrhea,[8] characterized by frequent, large, foul smelling, liquid stools. This condition is exceedingly difficult to treat and yet its persistence is detrimental to the patient. Tincture of opium, 2 cc. per dose up to 10 or 12 cc. a day, sometimes assists in checking the number of bowel movements. It should always be given but is particularly indicated whenever a sedative is required. Yeast sometimes increases the diarrhea and for that reason should not be given when other therapeutic agents are available. The administration of a cathartic is naturally avoided under all circumstances. After the pellagrin starts definite recovery, the number of stools slowly diminishes and the fecal material becomes more formed and less odorous. Thus it can be clearly seen that, in order to treat the diarrhea, it is necessary to cure the patient of pellagra, for then, and then only, will the diarrhea cease.

3. *Vomiting.*—Approximately two thirds of the severe cases of pellagra present persistent vomiting characterized by the retching of mucus and any material that may have been ingested.[8] Even cold water may provoke vomiting, and at times it occurs despite the fact that no food has been taken by mouth for days. The treatment is absolute bed rest and frequent feedings in from 10 to 15 cc. amounts of iced

6. Sturgis, C. C., and Isaacs, Rachael: Desiccated Stomach in the Treatment of Pernicious Anemia, J. A. M. A. 98:747 (Sept. 7) 1929.

7. Sharp, R. A.: An Antianemic Factor in Desiccated Stomach, J. A. M. A. 98:749 (Sept. 7) 1929.

8. Spies, T. D.: Unpublished observations.

fluids, such as eggnogs, malted milk or ginger ale, given very slowly, at intervals of from ten to fifteen minutes. These feedings should be supplemented by from 4 to 5 Gm. of desiccated hog stomach, yeast, liver extract or wheat germ until the required daily dosage is given. If the patient refuses these materials or cannot retain them, parenteral liver extract should be given immediately. In all instances, as soon as the vomiting subsides the caloric intake should be increased to 4,500 calories a day by supplementing a well balanced diet with eggnogs or malted milk, to which one of the specific curative agents has been added in sufficient quantities. If vomiting persists or has persisted for a long time prior to the patient's entering the hospital, subcutaneous injections of physiologic solution of sodium chloride can be given slowly to maintain the state of water and salt balance. The persistent vomiting of pellagra can usually be stopped, but if it continues the patient rapidly becomes worse and the prognosis is more grave.

4. *Abdominal Pain.*—An occasional pellagrin enters the hospital with severe abdominal pain, and, as soon as it can be determined definitely that the pain is not caused by a surgical condition, tincture of opium should be given for relief. Abdominal pain in cases of severe pellagra, strangely enough, is usually observed after convalescence begins. This pain is generalized, often severe, and usually somewhat intermittent in character. Since many of the patients soon learn that the ingestion of food definitely increases the abdominal discomfort, they refuse to continue eating, in which case their cooperation can be regained by the generous but not excessive use of opium for a short time.

5. *Nervous System.*—More than two thirds of the patients with severe pellagra have manifestations of central nervous system involvement,[5] peripheral neuritis or a combination of the two. The changes referable to "central neuritis" are characterised by confusion, disorientation, hallucination, dementia and mania. The manifestations often vary from day to day and even from hour to hour, and the patients may recover quickly or after a long period. Contrary to the general experience, the patients in this clinic have nearly always improved (90 per cent), though in some instances months of treatment were required. It is most difficult to achieve proper cooperation in some of these individuals and one may have to use the stomach tube and other methods in order to feed them. Naturally, sedatives are indicated in the maniacal type but should not be given in doses sufficiently large to render the patient stuporous over long periods of time, for this lessens the ingestion of food and the possibility of escaping infection. These individuals should have a caloric intake of 4,500 calories a day supplemented by ample quantities of a specific therapeutic substance, and they must be protected in order to avoid injury to themselves or others. The patient who once becomes mentally clear for a period of several days is unlikely to become deranged again unless he has a recurrence of the disease.

Peripheral neuritis is one of the most excruciatingly painful of all symptoms associated with pellagra. It usually occurs in the feet and legs, although at times in the hands and arms. It is characterized by hyperesthesia and alterations of the reflexes. While the neuritis is sometimes one of the presenting symptoms of the disease, it usually occurs after convalescence has begun. Large doses of sedatives are necessary for sleep. This condition often leads to a depressed state, and unless the patients are kept cheerful many of them will obtain large amounts of whisky or drugs, which may interfere with the desire for food and later prove to be detrimental. Ice bags and local medications containing phenol or menthol serve as temporary expedients and convince the patient that an attempt is being made to relieve his suffering. The signs and symptoms of neuritis may clear quickly or may last for weeks or months, but there is always a complete return of function provided the pellagrins receive adequate calories of a well balanced diet supplemented by one of the specific therapeutic agents. In the severe cases, physical therapy has a therapeutic usefulness.

As yet it has not been determined whether the injections of liver extract cure neuritis. Even though this material may have no direct therapeutic effect on the disturbance in the nervous system, it is conceivable that it might be indirectly beneficial in that it heals the gastro-intestinal tract, which in turn is able to absorb something from the food that might be capable of curing the mental and neurologic symptoms. It must be constantly kept in mind that, even when the patient with severe pellagra receives such a powerful therapeutic agent as large doses of parenteral liver extract, he should also have an adequate diet and rest. His complications and coexisting diseases should be given particular attention as well. It has been found that the small amounts of parenteral liver extract which are so effective in the treatment of pernicious anemia are too small to remit the severe case of pellagra.

6. *Anemia.*—More than 60 per cent of the patients with severe pellagra have a definite anemia.[6] About one third of the patients with anemia have a type characterized by a low color index, while others have an anemia with a high color index and an increased cell volume. The treatment of either one of these types is not an acute emergency and is best begun during the convalescent period. The great majority of individuals improve slowly after receiving an adequate diet. In others, the administration of large amounts of iron hastens the remission of anemia, but the patients with diarrhea must not be given iron until they begin to recover.

7. *Dermatitis.*—The characteristic dermatitis of pellagra is of great importance in the diagnosis of the disease. It may occur on any part of the body but is usually found over areas of irritation such as the hands, wrists, elbows, neck, under the breasts, knees, feet, and in the perineal region. These lesions heal easily (often even when the patient receives a diet low in pellagra-preventive material), so they cannot be used as a prognostic index except under one condition; namely, when the patient is receiving treatment and the skin lesions continue to progress for several days, the patient either is not receiving adequate therapy or is not utilizing the given material. The skin lesions of pellagra improve rapidly whenever suitable general therapeutic measures are applied, so that local treatments are never necessary unless secondary infection occurs. Mild antiseptics, however, such as potassium permanganate, 1:5,000 solution used as soaks or on sponges, often give the patient some relief and tend to diminish crust formation and secondary infection. After the skin lesions have begun to heal, the liberal application of ointment of rose water or olive oil prevents pruritus to some degree and increases desquamation.

The treatment of pellagra should not end with the return of health, for the disease relapses easily. The pellagrin must be observed at least once a month in

order to be certain that he is ingesting and assimilating large amounts of a well rounded diet. It requires special attention to afford protection to those patients when they have such predisposing conditions as poverty, chronic alcoholism, acute and chronic infectious diseases, poor teeth, diseases of the gastro-intestinal tract, diabetes, dietary idiosyncrasies, renal disease, surgical operations, insanity, pregnancy and lactation. For example, a quart of milk or 6 ounces of lean meat, when given as supplements to the diet, will usually prevent the development of the disease. Large amounts of turnips, tomatoes and green peas are also effective as aids to the diet.

COMMENT

By the personal application of the principles of treatment outlined, the mortality rate in a series of 125 severely diseased pellagrins was lowered (from 54 per cent in an earlier series) to 6 per cent. The rate of 6 per cent includes every patient with lesions of pellagra, regardless of other disease conditions such as pneumonia, uremia and diabetes, who died during hospitalization even though the pellagrous lesions had healed prior to death.

During the time the mental symptoms of pellagra were being observed, eight patients with delirium tremens but without pellagra were studied also. The patients in each group usually gave a history of heavy imbibition of alcoholic beverages over a long period, followed by the ingestion of smaller and smaller amounts of food. Since delirium tremens and pellagra often follow chronic alcoholic addiction and since the neurologic signs and symptoms of the two conditions are clinically indistinguishable in our series,[8] it seems possible that the nervous system of the patient with delirium tremens may be involved in a manner somewhat similar to that of the pellagrin who has mental symptoms. Unless delirium tremens is a manifestation of an intracranial pellagrous condition, no patient died from uncomplicated pellagra in our series.

Complete studies including postmortem examinations showed that two of the eight patients dying in this series had extensive bilateral lobar pneumonia, one uremia, one diabetic coma, one delirium tremens and bilateral infarction of the adrenals, one a large pulmonary infarction, one rheumatic heart disease and delirium tremens, and the other manifestations of delirium tremens. It is of general medical interest that three of the eight patients who died had definite cirrhotic changes of the liver.

All patients in these two groups entered either the Cleveland City Hospital or the Lakeside Hospital, and the general type of patient was the same. More than 95 per cent of all individuals in each series imbibed heavily of alcoholic beverages, and pellagra developed secondary to failure of food ingestion,[9] so the predisposing condition was the same in all instances. The disease represented in each series had the same pathogenesis and predisposing condition and was of similar severity with comparable complications. Were this not so, the present economic situation would have to be considered a factor. It is well known that pellagrins are prone to have recurrences of their disease and, since more of them have been successfully treated in this study, the incidence of recurrence is naturally greater than in the previous series (37 per cent as compared to 10 per cent). It is generally agreed that the prognosis becomes more grave with each recurrence of the disease, so the higher number of recurrences in the present series would tend to increase the mortality rate in general if all other conditions were equal. It has been shown in the present study that the mortality rate of comparable series of pellagrins was lowered from 54 per cent to 6 per cent by careful personal attention to details of general care, specific therapy, and treatment of complications and coexisting disease. Pellagra could not be considered the sole cause of death in any one of the eight patients who died, as each had extensive involvement of vital organs by other disease processes. In nearly every instance the pathologic changes of fatal disease other than pellagra were ample explanation for death. In four of the cases the pellagrous lesions had healed prior to death.

SUMMARY

It is shown in the present study that the severely diseased pellagrin can usually be cured of his disease, provided he receives sufficient amounts of a potent specific therapeutic agent, adequate rest, food and nursing care. In many instances treatment of the complications and coexisting diseases is essential.

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THE SPONTANEOUS HEALING OF RENAL TUBERCULOSIS

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From the time that Albarran popularized nephrectomy for the treatment of renal tuberculosis and Wildbolz proved the incontestable superiority of such surgery over the expectant or hygienic treatment of this disease, urologists have vainly sought a pathologic specimen of healed caseating renal tuberculosis without total destruction of the kidney. To the urologist the tuberculous kidney has behaved like a lymph node. Once it begins to break down it is physiologically lost.

Yet all the while there have been two hitches in the theoretical aspects of the case:

1. The pathologists, aware of the gallant enthusiasm that characterizes surgical theory and practice, have withheld their final judgment. To a pathologist everything is possible. Why not?

2. A few cases have been seen by the urologist, and many have been studied in tuberculosis sanatoriums, of what might be called tuberculous bacilluria. These did not seem to conform to the rule. Such bacilluria may be defined as a condition generally characterized by the appearance in the urine obtained by catheter from one or both ureters of a number—perhaps a considerable number—of acid-fast bacilli, toxic to the guinea-pig. The urine may contain a few red cells and a few pus cells. The patient has no subjective symptoms. The pyelogram shows no deformity. The kidney function is not notably impaired. Most important of all, the lesion may heal, cells and bacilli disappear from the urine and the patient remain well thereafter. Or if the patient dies of concurrent pulmonary tuberculosis or other cause, section reveals no lesion in the "tuberculous" kidney.

In the latter event the pathologist accepts the case as one of healed renal tuberculosis and thinks no more about it. But the urologist comes forward with a choice among several pretty theories:

1. "The healthy kidney can transmit living tubercle bacilli." This is pathologic heresy. A living cell does

not transmit living tubercle bacilli. Moreover, a sufficient number of these cases have shown pus and red cells in the urine to prove there is a lesion—somewhere.

2. Thus the urologist must either grant that renal tuberculosis does heal without total destruction—indeed, without any gross destruction—of the kidney or allege a contamination from tuberculosis elsewhere in the urinary tract, probably in the prostate. This will not hold either; certainly not in women.

The cases are so rare that until Medlar made his observations the situation stood thus; urology obstinate, pathology patient. In a practice covering thirty-five years and going back to the prenephrectomy period, I have encountered but one case of tubercle bacilluria and but four patients who, having been assured by competent authority (three of them confirmed by guinea-pig) that they had renal tuberculosis (were well and not nephrectomized), when I last saw them.

Case 1.—Acid-fast bacilli in the urine twenty years ago. No symptoms. I removed the patient's hypertrophied prostate last year. He is well.

Case 2.—Schlagintweit made the diagnosis by guinea-pig. I saw the young woman a year later with typical elusive ulcers. There were no bacilli. Renal function was perfect. (A doubtful case.)

Case 3.—A young trained nurse with pain in right loin. Diagnosis by pig (I saw the lesions). Movable kidney. Nephrectomy. No tuberculosis.

Case 4.—Red cells and acid-fast bacilli by smear. Nephrectomy advised but not performed. The patient then consulted me. I have watched him for four years. The urine is normal. Pyelogram negative. Health perfect. Repeated search reveals no acid-fast bacilli.

Case 5.—Man, aged 39. Left nephrectomy by me in 1913. The kidney was actively tuberculous. The urine from the right ureter contained no pus; no bacilli by smear. Two guinea-pigs were inoculated with urine from the right ureter; one developed tuberculosis, the other did not. Within the next year the patient developed bilateral epididymal tuberculosis and active pulmonary tuberculosis. These were promptly controlled. The patient is alive and well today, in his sixty-first year, twenty-one years after the nephrectomy.

Let me add a note on my one case of exclusively prostatic tuberculosis:

Case 6.[1]—Man. In 1919 bladder symptoms (age 37 years). In 1920 pus and acid-fast bacilli in the urine. The prostate was palpably inflamed. In 1923 cystoscopy was negative; no pus or acid-fast bacilli from either kidney. Bladder urine in two glasses, first glass purulent, second glass free from pus. In 1924 suprapubic excision of tight bladder neck, reported tuberculosis. In 1934 the prostate felt approximately normal. There has been relief of symptoms since operation. No acid-fast bacilli on repeated examinations but still pus in first urine passed. In 1934 he remains well.

Such cases are subject to various interpretations and are not calculated to compose the points of view of laboratory and clinic. Indeed, still further confusion is introduced by the periods of quiescence of surgical renal tuberculosis. I have reported two such cases[2] at intervals respectively of three and six years, one of which showed no cells or bacilli in the urine during the interval. I can now add a third, silent for three or four years.

Case 7.—A woman, aged 21 in 1915. Three months bladder symptoms, pain in right loin, hematuria. Pus and numerous acid-fast bacilli. Typical tuberculous lesion about the right ureter mouth. Urine from the left ureter was normal. Nephrectomy was refused. She became spontaneously well. She drove a motor transport in New York during the war. Married. Symptoms recurred in 1919. In 1923 urinalysis showed red blood cells. No tubercle bacilli by smear or pig. Cystoscopy by Bugbee negative. Pyelogram showed absence of upper calices, dilatation of lower calices. "Function of left kidney five times that of right."[3] Nephrectomy by Bugbee. Typical tuberculosis.

Into this confusion steps Medlar with what should be a clear light. By infinite pains and complete serial section of kidneys from patients showing renal tubercle bacilluria he demonstrates that:

1. Renal tuberculosis is originally a hematogenous lesion, doubtless usually bilateral.

2. There is always a period of initial clinical quiescence (doubtless often lasting several years) during which either

(*a*) These lesions heal in one or both kidneys. This is renal bacilluria. Let it be given the term nonsurgical renal tuberculosis.

(*b*) In one or both kidneys gross destruction of tissue (caseation and so on) occurs. This is surgical renal tuberculosis. The urologist of my generation still regards this as essentially a progressive destructive lesion, requiring nephrectomy to save the patient's life, although most exceptionally (in some 2 to 4 per cent of cases) resulting only in pathologic nephrectomy and not spreading to other organs.

But the pathologists remain unconvinced. Medlar himself seems to encourage clinicians to defer nephrectomy while they tinker with hygiene and quartz lights in the bladder. To me this is dreadful. Even if the nonsurgical kidney may show some minute necrosis and yet ultimately heal, this does not invalidate the surgical position that a tuberculous kidney that shows deformity by pyelogram requires nephrectomy:[4] not hasty nephrectomy but surely prompt nephrectomy.

Let the urologists who are being seduced to dally with this destructive, this fatal, disease beware. The surgically tuberculous kidney is doomed and even pathologic nephrectomy, rare as it is, often fails to mean healing of the tuberculosis.

Case 8.[4]—Diagnosis of pyonephrosis due to stone in lower ureter. Nephrectomy. The kidney tissue replaced almost wholly by sclerotic fat. "The cut surface was smooth and glistening and showed white strands outlining irregular, pink lobules which had yellow fatty centers. . . . A much compressed piece of kidney substance at the upper pole. . . . There was little in the mass to distinguish it as kidney. . . . A number of round tubercles . . . coagulation necrosis . . . giant cells." This therefore is a pathologic nephrectomy, yet the tuberculosis is unhealed.

Contemplate, indeed, what a pathologist means by healed renal tuberculosis. He means that the tuberculosis has healed without destroying the kidney. If the lesion is a surgical one and the kidney has been destroyed by a mixed infection, the pyogenic element destroying the tuberculosis as well as the kidney, that will pass, and justly, with the pathologist as healing of renal tuberculosis without total destruction of the kidney by the tuberculosis. But such a finis does not amuse the clinician.

1. Keyes, E. L.: J. Urology 14:203 (Oct.) 1925.
2. Keyes, E. L.: Tr. Am. Assn. 9:17, 1913.
3. Bugbee: Tr. Am. A. G.-U. Surgeons 27:95, 1934.
4. Especially for me and prior to surgery dealt with the problem of treatment of unilateral surgical renal tuberculosis. A patient of mine, thanks to pyelography, lives today with a simple tuberculous kidney and excellent renal function; but he will die of his disease. The lesson learned by him was gone twenty years before, unfortunately though the patient had other bladder lesions I recognized their close, early localized renal relations and successfully eradicated.
5. Bugbee: Tr. Am. A. G.-U. Surgeons 29:7, 1936.

Here is an example: The patient died of pyonephrosis, renal insufficiency and gangrene of the bladder due primarily to renal (and prostatic) tuberculosis. Yet the pyonephrotic kidney shows only scattered, calcified, healed lesions of tuberculosis—the strictures in the ureter nicely proving the character of the calcified renal lesions. The pathologist accepts this as healed tuberculosis without total destruction of the kidney yet, I repeat, the patient died of pyonephrosis.

CASE 9.—*History.*—C. L., a man, aged 61, admitted Jan. 26, 1934, complained of retention of urine and was actually utterly emaciated, dehydrated, semiconscious, moribund. There was a history that fifteen years before he had retention of urine relieved by some form of operation, possibly on the bladder neck, possibly an internal urethrotomy. The symptoms were relieved for two years but since that time he had had frequent and difficult urination from time to time and had to be catheterized with increasing frequency until seven weeks before admission complete retention of urine definitely set in and he was treated by intermittent catheterization, under which he daily grew worse until he was brought to the hospital in the condition outlined. Physical examination revealed a blood pressure of 110 systolic, 70 diastolic, a few enlarged cervical nodes, moist rales scattered over both lungs but most marked at the right base, a prostate from which pus could be extruded and of which the right lobe was twice the normal size, a bladder distended with urine above the pubes, the urine watery and muddy with pus. The blood urea was 141 mg., blood sugar 130; the Kline test for syphilis was negative.

Carcinoma of the prostate was suspected. Roentgen examination of the pelvis and chest showed no bony metastases but revealed healed tuberculosis of both lungs.

An indwelling catheter was placed and bladder irrigation was done but the urine was so muddy that the catheter could not be kept patent. The next day, therefore, under local anesthesia with the aid of incomplete nitrous oxide anesthesia (in order to control the patient's delirium)[1] a rapid suprapubic cystostomy was done. The finger was swept about the bladder but no tumor of the bladder or prostate was identified. Two shallow diverticula were felt and the persistent thick pus in the urine was noted. A tube was left both in the suprapubic wound and in the urethra. Warm boric acid continuous irrigation of the bladder was kept up through these and in addition to the hypodermoclyses that had previously been instituted a cannula was tied into the median basilic vein and in the course of twenty-four hours 4,000 cc. of 10 per cent dextrose solution was given intravenously and this dehydration treatment continued in lesser intensity throughout the illness.

Under this treatment in forty-eight hours the blood urea fell from 141 to 59 mg. A day later it stood at 115 and on the sixth day after operation at 81 mg. Meanwhile the patient had become comatose and developed hiccup, which could not be controlled even by inhalation of carbon dioxide. The urinary output fell from 1,200 to 400 cc. a day and on the eleventh day after admission and the tenth day after operation (Feb. 7, 1934) the patient died.

Autopsy.—The right kidney weighed 180 Gm., with some adherent perirenal fat. It was somewhat larger than usual and the capsule would not strip from it. The entire kidney presented a lobulated vacuolated appearance and felt fluctuant. On section the parenchyma was greatly reduced, the medulla and cortex measuring only 1 cm. at the thickest portion.

The remainder of the kidney was made up of tremendously dilated kidney pelvis and calices containing thick, yellow pus. The mucosa of the pelvis and calices was greatly thickened.

Leading from the kidney was a greatly dilated and tortuous ureter with a mucosa similar to that of the kidney pelvis. The ureter had no organic obstruction except the kinking, and it entered the bladder through a greatly widened ureteral orifice.

The left kidney weighed 75 Gm. It was much smaller than the right kidney and also felt fluctuant. On section it was composed of merely a thin capsule of fibrous tissue containing very thick pus. This apparently inspissated purulent material was of a whitish yellow, opaque color and was almost pasty in consistency. A part of the lining of the vacuoles composing this kidney was partially calcified and some of the pasty content had a gritty character. The kidney pelvis, of which the described sacs were extensions, presented a fibrous, rough, thick mucosa and could not be demonstrated to communicate with the ureter. This ureter was much shorter than the right. It had a lumpy, nodular appearance through its course to the bladder and in many areas its lumen was obliterated. The dilated portions forming the nodules contained a gritty, apparently calcified, whitish yellow, heavy, pasty material. No probe could be passed from the ureter to the bladder.

The bladder was greatly scarred and shrunken. The mucosa was hemorrhagic, edematous and thickened, and it presented two vacuolar offshoots in its fundus, each about 0.5 cm. in diameter, communicating with the bladder by an ostium approximately 0.5 cm. in diameter. The capacity of the bladder was 30 cc. The urethral outlet was unobstructed. The opening of the left ureter could not be found. The right ureteral orifice was as described.

The prostate was slightly enlarged. On cross section there was seen to be in each lateral lobe a nodule composed of several small yellowish nodules, each larger nodule being approximately 1 cm. in diameter.

The seminal vesicles and vasa were not remarkable. The right epididymis contained at the end joining the vas a firm nodule approximately 15 cm. in diameter, and section of this revealed it to be composed of a brownish yellow purulent material, which was gritty to feel. The left epididymis and both testes were not unusual.

The lungs weighed 735 Gm. At each apex was a fibrous tag where the visceral and parietal pleura were adherent to each other and beneath these were moderate sized depressed scars in the lung tissue. The lungs appeared to contain less pigment than usual and had a billowy blown-out appearance, containing many large subpleural blebs. Over the posterior part of the right lower lobe was a depressed red area, and whereas the rest of the lungs felt crepitant this area had a less crepitant, fleshy, feel. Throughout both upper lobes, especially near the apexes, were many hard apparently calcareous nodules, the largest of which were approximately 1 cm. in diameter. The tracheobronchial lymph nodes were not unusual; some just below the bifurcation of the trachea were almost completely calcified. One along the right side of the trachea immediately above the right bronchus was partly calcified.

Microscopic examination of the prostate showed two distinct processes. In each lateral lobe there was a circumscribed nodule of glandular tissue in which the acini were lined by a tall columnar one or two layered epithelium containing many papillary infoldings. Into many of these acini there had been marked epithelial degeneration, and many corpora amylacea also were found. The other process was one associated in varying degrees of intensity with lymphocytic, monocytic and plasma cell infiltration of large areas of the organ with an acidophilic necrosis of the more central parts of the areas with a loss of the architecture of the organ here. A similar infiltration was found to surround many of the glandular acini and their ducts. Most striking, however, was the bilateral presence of foci of monocytes and lymphocytes surrounding coexisting areas of epithelioid cells and containing giant cells, constituting typical active tubercles.

The middle lobes of the lung showed marked emphysematous changes with widely dilated alveoli, which had in some areas broken into one another, with the broken ends possessing club shaped enlargements.

The lower lobe of the right lung showed a moderate degree of congestion with a filling of alveoli by mononuclear and polymorphonuclear leukocytes in many areas and here and there hemorrhage into the alveoli. The subpleural and interlobular tissues were edematous and the alveolar walls were somewhat thickened.

The right kidney showed a marked diminution of the cortex and medulla, with bands of infiltrating lymphocytes scattered through them extending from the pelvis to the medulla. The whole section showed evidence of glomerular and tubular damage. In the worst affected area the glomeruli were only hyaline nodules, and the subadjacent tubules were atrophied or absent. Less advanced changes were found elsewhere, with a

greater or less degree of thickening of Bowman's capsule and diminution in size of the glomerular vessels showing a moderate to advanced degree of hyaline intimal thickening. There was no histologic evidence of tuberculosis.

The bladder mucosa was almost entirely lacking and the small remnants that were to be found were necrotic. The submucosa was edematous and massively infiltrated with wandering cells, most of which were polymorphonuclear leukocytes. In the muscular coat of the bladder there was a moderate degree of lymphocytic and monocytic perivascular infiltration. Just outside the bladder wall were two areas of dense lymphocytic and monocytic accumulation with epithelioid cells in their central portions and some necrosis of the latter. One of these nodules contained a giant cell.

Spermatogenesis was relatively inactive.

The lipoid content of the adrenal, as judged by the vacuolization of the cortical cells, was very high, but nothing else of note was to be found.

There was very slight thickening of the larger arterioles of the heart. In several areas near the epicardial surface of the heart were small foci in which the muscle fibers had been interrupted by a process producing fibrous tissue, which in some instances was infiltrated with lymphocytes, monocytes and a few polymorphonuclear leukocytes. These resembled small areas of infarction.

The right epididymis was not unusual save for some very deeply basophilic granules resembling calcium deposits in some of the tubules.

The sections of the left kidney were taken through that part of the organ showing the most kidney tissue. There was everywhere replacement of renal tissue by dense fibrous tissue, and the connective tissue thickening in the region of the pelvis was very conspicuous. Scattered diffusely through the connective tissue were small accumulations of lymphocytes. Nothing resembling giant cells or epithelioid cells was to be found. The few renal elements remaining consisted in part of dilated tubules and other more normal appearing tubules, which, however, contained an acidophilic coagulation in their lumens. There were a few glomeruli of apparently normal structure, but there were many that existed only as fibrous nodules. The intima of all the blood vessels of the sections was greatly thickened.

The mucosa of the left ureter was necrotic and the submucosa was very remarkably thickened by fibrous tissue, most of which was hyalinized. Scattered very sparsely through the latter and through the muscularis were a few lymphocytes, a little more numerous about the adventitial blood vessels.

In the pancreas in some areas there was a very slight increase in connective tissue elements but there were no noteworthy changes.

The spleen weighed 120 Gm. It was remarkably congested and the blood throughout had escaped from the sinuses and had in many areas lost its cellular detail. There was a conspicuous hyperplasia of the mononuclear elements and the malpighian corpuscles were slightly reduced in size and were edematous. The blood vessels possessed moderate to marked arteriolar and arterial internal thickening.

Culture of the heart blood was sterile. Cultures of the right and left kidneys yielded B. coli-communis and enterococci.

The pathologic diagnosis of the significant lesions was gangrene of the bladder; bilateral pyonephrosis; calcareous grit in the right kidney; cardiac infarcts; active prostatic and perivesical tuberculosis; healed tuberculosis of both lungs (superinfection), left kidney, left ureter and right epididymis.

This, I feel, is a good example of a surgical renal tuberculosis for which nephrectomy years ago should have prolonged the patient's life. Yet pathologically it was a healed partial surgical tuberculosis of the kidney.

COMMENT

1. Medlar has shown that renal tuberculosis begins as a nonsurgical lesion that frequently heals.

2. This lesion may be identified clinically as a tuberculous bacilluria (as defined in the text).

3. Surgical renal tuberculosis, characterized by gross changes shown by pyelography, is clinically a progressive disease with a fatal termination unless interrupted by nephrectomy.

4. The pyelogram discloses surgical tuberculosis. The earlier the nephrectomy, the greater the probability of cure.

5. The healing of surgical renal tuberculosis by pathologic nephrectomy is extremely rare and, even with the kidney function gone, active tuberculosis may persist.

6. The pathologist will continue to accept cases like case 9 as evidence of healed partial surgical tuberculosis of the kidney. To the urologist such cases have no interest, for

7. Though surgical renal tuberculosis may remain latent for long periods of time, latency is extremely rare and even in its most complete form, i. e., latency due to complete physiologic destruction of the kidney, the tuberculosis may still actually be active.

8. The curative treatment of renal tuberculosis—old and new—is nephrectomy.

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THE STATUS OF THE KIDNEYS IN ALKALOSIS

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It is an established fact that the kidneys play an important part in maintaining the acid-base equilibrium and thus also in maintaining a constant p_H in the blood and tissues. When this renal function is impaired, the acid-base mechanism is more readily disturbed and the compensating mechanism is more subject to deflection by the ingestion of either acid or basic salts. Conversely, primary renal impairment is very frequently accentuated by overzealous administration of acid or basic salts. We frequently hear of and see instances of depletion of the alkali reserve resulting in compensated or uncompensated acidosis, but rarely do we consider a depletion of the acid reserve with compensated or uncompensated alkalosis and the distressing symptoms associated with this condition. Our present paper concerns itself primarily with the relationships of renal function to alkalosis resulting from the administration of alkalis.

It was early recognized that it was dangerous to administer alkalis to a person whose kidneys had been injured, in amounts sufficient to neutralize gastric acidity. Palmer and Henderson [1] gave 4 Gm. of sodium bicarbonate to individuals and then checked the p_H of the urine at intervals of one and two hours. Normal individuals gave evidence of a maximal rise in p_H in one hour, a few gave evidence of a delayed maximal rise in the p_H of the urine, and the remainder gave no response to administration of the alkali. Members of the latter group had nephritis. Several ingested from 12 to 112 Gm. of sodium bicarbonate before a change of urinary p_H was noted. Sellards [2] and later Palmer and Van

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1. Palmer, W. W., and Henderson, L. J.: Clinical Studies on Acid Base Equilibrium: Nature of Acidosis, Arch. Int. Med. 13: 153-170 (Aug.) 1913.

2. Sellards, A. W.: The Determination of the Equilibrium in the Human Body Between Acids and Bases, with Especial Reference to Acidosis and Nephropathies, Bull. Johns Hopkins Hosp. 23: 289-302, 1912.

Slyke[3] noted that among normal people the ingestion of from 5 to 10 Gm. of sodium bicarbonate turned the urine alkaline, at which time the carbon dioxide combining power of the blood plasma was 71 volumes per cent plus or minus 5 per cent. Most of the pathologic urines examined did not become alkaline until a much higher carbon dioxide combining power was present. Palmer and others[4] noted that, when the blood urea was elevated, a larger amount of sodium bicarbonate was required before the urine became alkaline. They explained the variations in amounts of ingested alkali necessary to make the urine alkaline by variations in degree of disturbance of the acid-base regulatory mechanism of the kidney. They found no close relationship between this function and the phenolsulphonphthalein output or the height of blood urea.

Hardt and Rivers[5] first described, in a very complete manner, the toxic manifestations following alkaline treatment of peptic ulcer, associated with renal changes, increased blood urea, and a normal or increased carbon dioxide combining power of the blood. In three of their sixteen cases of alkalosis, definite previous renal injury had been present. They felt that patients with duodenal ulcer and with pathologic changes in the kidneys were more inclined to have toxic manifestations, and to a much greater degree, than those who did not have such renal changes. Others since that time have reported cases of alkalosis following ingestion of alkali in which impaired renal function was known to have been present before.[6] Hardt and Rivers felt that renal injury, either inflammatory or vascular in origin, increased the tendency to alkalosis on administration of alkali. No definite opinion exists as to the cause for the remaining cases of alkalosis in which the condition is unassociated with pathologic changes in the kidneys. Rafsky, Schwartz and Kruger[7] and Hardt[8] felt that many of these patients were sensitive to alkali and that, by proper administration, beginning with small doses and gradually increasing the dose, alkalosis would not develop. Addis and his co-workers[9] placed a group of rats on a diet containing 4 per cent sodium bicarbonate for a third of their average lifetime. Of the twenty-four rats in the group, seven had hydronephrosis. All twenty-four presented evidence of microscopic, and many of gross, hematuria, in contrast to groups of rats on an acid diet and a group on a neutral diet, the animals composing which had normal urine. At postmortem examination no apparent microscopic difference in the kidneys was seen in the three groups. No other data could be found favoring renal injury by use of alkali. Gatewood and his associates[10] did not recognize nephritis in any case in which alkalosis developed later, nor did they recognize evidence of renal injury from the use of alkali in any case in their series.

The recognition of this condition is important, not only from the standpoint of immediate care, but also from that of future care. Jordan and Kiefer[11] found that 30 per cent of sixty patients unsuccessfully treated medically had had alkalosis. Twenty-three of these patients suffered recurrence of symptoms within one year. They felt that a definite relation existed between hypertension, arteriosclerosis and vascular nephritis, since more than one half of the patients in their group were so afflicted.

MATERIAL FOR STUDY

Seven cases were studied in which there were definite symptoms and serologic evidences of alkalosis following intensive use of alkali in the treatment of peptic ulcer.

Although each case will be considered separately later, a few general points first will be made: The patients were all men between 30 and 49 years of age, save one (patient 3), who was 70. This patient had a perforating carcinoma of the stomach. In case 4 an ulcer was not demonstrable either clinically or roentgenologically. The remaining patients had duodenal ulcers. None had a previous history of nephritis. The blood pressure was normal in six of the seven cases. Patients 2 and 3 had palpable, peripheral sclerosis graded 1 and 2 respectively. A mild to moderate degree of anemia was present in each case save cases 2 and 7. Five of the patients were admitted to the hospital in a state of alkalosis, which had followed the daily ingestion of from 15 to 60 Gm. of alkali for from two to four months. In cases 2 and 7, alkalosis developed in the hospital while the patients were on a modified Sippy regimen, receiving about 14 to 16 Gm. of alkali daily. The symptoms of distaste for milk, anorexia, nausea and vomiting, weakness, nervousness, mental confusion, dull steady headache, polydipsia and polyuria, numbness and tingling, cramps and, in several instances, tetany were quite outstanding in these cases. The carbon dioxide combining power of the blood ranged from 69 to 84 volumes per cent. We considered any carbon dioxide combining power of 65 volumes per cent or more as being indicative of alkalosis.[12] Impaired renal function was indicated by a value for blood urea of 45 mg. or more per hundred cubic centimeters, a return of 45 per cent of phenolsulphonphthalein or less, serum sulphates of 5.5 mg. or more per hundred cubic centimeters, and a urea clearance of less than 40 cc. of blood cleared per minute (Van Slyke). Other evidence of renal injury was denoted by protein, casts or erythrocytes in the urine.

REPORT OF CASES

Case 1.—A man, aged 30, had a ten year history of duodenal ulcer but none of nephritis. Two months prior to his registration at the clinic, symptoms of ulcer had become more acute and he had increased his intake of alkali to from 1 to 1½ ounces (30 to 45 Gm.) of sodium bicarbonate daily. Ten days later he had symptoms of weakness, dyspnea on exertion, frontal headache, nocturia one or two times, mental confusion, emotional instability and a feeling of uncertainty and vertigo, and a profound distaste for milk and a craving for salt.

On examination his face was flushed, he appeared to be depressed, and he was confused mentally. The blood pressure in millimeters of mercury was 160 systolic and 100 diastolic.

3. Palmer, W. W., and Van Slyke, D. D.: Studies of Acidosis: IX. Relationship Between Alkali Retention and Alkali Reserve in Normal and Pathologic Individuals, J. Biol. Chem. 50: 499-507 (Oct.) 1917.

4. Palmer, W. W.; Stevens, Harold, and Jackson, Henry, Jr.: Relationship Between Blood Plasma Bicarbonate and Urinary Acidity Following the Administration of Sodium Bicarbonate, J. Biol. Chem. 48: 101-111 (Dec.) 1920.

5. Hardt, L. L., and Rivers, A. B.: Toxic Manifestations Following the Alkaline Treatment of Peptic Ulcer, Arch. Int. Med. 31: 171-188 (Feb.) 1923.

6. Bevers, G. E.; Easterman, G. B.; Hartman, H. R., and Rewstow, L. G.: Toxic Nephritis in Pyloric and Duodenal Obstruction; Renal Insufficiency Complicating Gastric Tetany, Arch. Int. Med. 28: 425-455 (Sept.) 1921. Ellis, A. W. M.: Disturbances of Acid-Base Equilibrium of the Blood to the Alkaline Side: Alkalosis, Quart. J. Med. 17: 405-423 (July) 1924.

7. Rafsky, H. A.; Schwartz, Louis, and Kruger, A. W.: The Relation of Alkalosis to Peptic Ulcer, J. A. M. A. 99: 1583-1586 (Nov. 5) 1932.

8. Hardt, L. L. Jr., in discussion on Rafsky, Schwartz and Kruger.[7]

9. Addis, Thomas; MacKay, E. M., and MacKay, Lois L.: The Effect on the Kidney of the Long Continued Administration of Diets Containing an Excess of Certain Food Elements, J. Biol. Chem. 71: 137-166 (Dec.) 1926.

10. Gatewood, W. E.; Gaebler, O. H.; Munteyler, Edward, and Myers, V. C.: Alkalosis in Patients with Peptic Ulcer, Arch. Int. Med. 48: 79-105 (July) 1931.

11. Jordan, Jere M., and Kiefer, E. D.: Factors Influencing Prognosis in the Medical Treatment of Duodenal Ulcer, Am. J. Surg. 15: 473-483 (March) 1932.

12. This figure was determined because, in a long series of cases of peptic ulcer in which symptoms of alkalosis developed, the carbon dioxide combining power was 65 volumes per cent or more.

The heart measured 3 cm. to the right and 10 cm. to the left of the median line. There was palpable peripheral sclerosis of grade 1. The arterioles of the ocular fundi were constricted, but there was no evidence of sclerosis of the retinal arteries. The specific gravity of the urine was from 1.005 to 1.010 and the urine contained protein graded 2. There was a return of 15 per cent of the phenolsulphonphthalein injected, the value for blood urea was 134 mg., for creatinine 5 mg., and for chlorides 495 mg. per hundred cubic centimeters, for carbon dioxide combining power 79 volumes per cent, and for blood sulphates 10.5 mg. per hundred cubic centimeters. The value for hemoglobin and the erythrocyte count were normal. Gastric analysis revealed a free hydrochloric acid value of 18, total acidity of 64, and a content of 150 cc. Fluoroscopic examination of the stomach and duodenum disclosed a duodenal ulcer with obstruction and marked dilatation of the stomach.

The patient was put on an ulcer regimen. Tribasic calcium phosphate was administered, instead of sodium bicarbonate, as alkali. Daily intravenous injections of 10 per cent dextrose and 1 per cent sodium chloride solution were given, together with from 2 to 3 liters of fluid by mouth. Eleven days after admission the value for the blood urea was down to 48 mg. per hundred cubic centimeters, the carbon dioxide combining power to 65 volumes per cent, and the chlorides up to 611 mg. per hundred cubic centimeters. The return of phenolsulphonphthalein was 15 per cent, and the protein in the urine remained at grade 1 to 2, with low specific gravity. All toxic symptoms had disappeared. Posterior gastro-enterostomy was performed, and convalescence was uneventful. On the patient's dismissal from the hospital fifteen days after operation, the value for urea was 44 mg. and for creatinine 1.7 mg. per hundred cubic centimeters, the carbon dioxide combining power was 58 volumes per cent, urea clearance was 19.1 cc. of blood cleared per minute, and the urine still contained albumin graded 2; the specific gravity of the urine ranged from 1.010 to 1.016. It is impossible to say how much renal injury was present before the onset of toxicity produced by alkalosis, but it is probable that renal function was impaired to a considerable extent and that this condition was augmented by the administration of large amounts of alkali and, concurrently, that alkalosis was aggravated by impaired renal function.

CASE 2.—A man, aged 38, gave a history of ulcer of two years' duration, but there was no previous history of renal disease. On admission to the hospital, analysis of the gastric content revealed a total acidity of 80, free hydrochloric acid of 72 and a content of 205 cc. Fluoroscopic examination of the stomach and duodenum disclosed a duodenal ulcer. The urine had a specific gravity of 1.023; it contained albumin graded 0 and casts graded 2.

The patient was placed on an ulcer diet with eight alkali powders a day. On the fourth day the value for blood urea was 30 mg. per hundred cubic centimeters and the urea clearance 67.6 cc. of blood cleared per minute. Five days after the patient's admission polydipsia and polyuria developed and the patient drank from 3 to 5 liters of fluid daily; the urinary output was from 2 to 3.5 liters in twenty-four hours. He also had a bad taste in his mouth, with distaste for milk. On the seventh day milk tasted worse, he complained of pain in the calf of the right leg, and he felt weak, giddy and tired. Chvostek's sign was positive. A test of hepatic function gave negative results. At this time the carbon dioxide combining power of the blood was 79.6 volumes per cent, chlorides were 553 mg. per hundred cubic centimeters, and the return of phenolsulphonphthalein was 35 per cent. The urine contained protein graded 2; its specific gravity was 1.011 on a routine specimen and fell to only 1.005 on a dilution test.

Alkaline powders were changed to tribasic calcium phosphate, 12 Gm. daily, and calcium chloride, 4 Gm. daily. The fluid intake was raised to 3 liters daily. The symptoms of toxicity from alkalosis disappeared gradually, the distaste for milk being the last symptom to leave, on the seventh day. At the time of the patient's dismissal seven days later the urine still contained albumin graded 1, its specific gravity was 1.011, and the serum sulphates were a little elevated, being 5.7 mg. per hundred cubic centimeters. It is probable that this patient had a latent type of impaired renal function which, under ordinary circumstances, was not of clinical significance.

CASE 3.—A man, aged 70, gave a three-year history of ulcer symptoms; this condition had become much worse during the three months prior to admission. A roentgenogram of the stomach revealed a large perforated ulcer, high on the lesser curvature, with an accessory pocket; this ulcer was thought to be malignant. Total acidity was 56 and free hydrochloric acid 44. The patient had been taking considerable sodium bicarbonate for relief of pain.

On admission the patient presented symptoms of nausea and vomiting and had a marked distaste for milk. On examination the blood pressure in millimeters of mercury was 120 systolic and 75 diastolic. There was palpable peripheral sclerosis graded 2. The carbon dioxide combining power of the blood plasma was 84 volumes per cent, and the value for blood urea 32 mg. and for chlorides 594 mg. per hundred cubic centimeters. The value for hemoglobin was 9.1 Gm. per hundred cubic centimeters, erythrocytes numbered 3,800,000 per cubic millimeter of blood, and the urine contained protein graded 1 and numerous casts. The specific gravity of the urine ranged from 1.007 to 1.030.

On a carefully controlled ulcer diet, together with restriction of alkalis, the toxic symptoms cleared up and the pains from ulcer were controlled. Two weeks later the patient was comfortable. On analysis the return of phenolsulphonphthalein was 75 per cent, the value for blood urea 40 mg. per hundred cubic centimeters, the urea clearance 71 cc. of blood cleared per minute, and serum sulphates 5.1 mg. per hundred cubic centimeters. The patient continued on medical management, at his own request, despite the possibility of the lesion being malignant. One and a half months later the condition of his kidneys was again evaluated. The value for blood urea at this time was 58 mg. per hundred cubic centimeters, the urea clearance was 25 cc. of blood cleared per minute, serum sulphates were 6.2 mg. per hundred cubic centimeters, the carbon dioxide combining power of the blood plasma was 58 volumes per cent, blood chlorides were 611 mg. per hundred cubic centimeters, and the return of phenolsulphonphthalein was 35 per cent. The patient's symptoms had increased. An exploratory operation was performed and he was found to have an inoperable carcinoma of the stomach graded 4, for which a palliative gastro-enterostomy with entero-anastomosis was done.

This patient undoubtedly had a moderate degree of renal insufficiency, probably on a vascular basis, which condition made alkalis less tolerable and resulted in increased renal impairment. The delayed rise in the value for blood urea is of interest, and this phenomenon is also frequently observed in cases of acidosis.

CASE 4.—A man, aged 35, gave a history of gastric distress of fifteen years' duration. He had been treated for duodenal ulcer. Prior to coming to the clinic he had been taking from 1 to 2 ounces (30 to 60 Gm.) of alkali powders a day for several weeks. A week before admission he had had nausea, vomiting, anorexia, vertigo and headache. Roentgenograms of the stomach and esophagus, at the clinic, gave negative results. No acid was found in the first fluid aspirated from the stomach but, at one and a quarter hours, the total acidity was 38 and the free hydrochloric acid 24. The patient was reported to have spasm of the cardia. The urine contained albumin graded 2, and its specific gravity ranged from 1.005 to 1.010. The value for blood urea was 146 mg., for creatinine 7.2 mg., and for chlorides 527 mg. per hundred cubic centimeters. The concentration of hemoglobin was 85 per cent and erythrocytes numbered 4,120,000 per cubic millimeter of blood. Unfortunately, the value for the carbon dioxide combining power was not estimated on admission. The urea clearance was 13.9 cc. of blood cleared per minute and the sulphate clearance was 10.5 cc. of blood cleared per minute. The return of phenolsulphonphthalein was 35 per cent.

The patient was put to bed and took fluids by mouth up to 7 liters a day, which he tolerated very well. He passed as much as 7,400 cc. of urine in twenty-four hours, and the output was consistently more than 3 liters a day. Toxic symptoms cleared up remarkably, and in six days the value for urea was 34 mg., for creatinine 2.0 mg., and for chlorides 617 mg. per hundred cubic centimeters, and the carbon dioxide combining power was 47.5 volumes per cent. Before dismissal and after tonsillectomy, the value for urea was 18 mg. and for sulphates

3.9 mg. per hundred cubic centimeters, and the urea clearance was 45.5 cc. of blood cleared per minute. The urine continued to contain protein and was of low specific gravity, even when normal amounts were passed. Undoubtedly this was a case of renal impairment, aggravated by alkalosis. It is doubtful whether alkalosis would have occurred if renal function had been adequate.

Case 5.—A man, aged 48, presented a history of an intermittent type of ulcer distress for seven years; during the last year the condition had become much more persistent and severe. Eight months prior to admission he had had three gastro-intestinal hemorrhages; these had been associated with fainting and had been followed by tarry stools. He had obtained relief from epigastric pain with milk and alkaline powders, and he had resorted to the liberal administration of these, taking from six to eight powders daily.

At the time of admission the patient complained of faintness, headaches, anorexia, and a distaste for milk. The urine had a specific gravity of 1.008 and it contained protein graded 1. The value for hemoglobin was 4.6 Gm. per hundred cubic centimeters, and erythrocytes numbered 2,860,000 and leukocytes 6,900 per cubic millimeter of blood. The value for blood urea was 78 mg. per hundred cubic centimeters, the return of phenolsulphonphthalein was 30 per cent, the carbon dioxide combining power was 75.8 volumes per cent, and the blood chlorides were 585 mg. per hundred cubic centimeters. A test of hepatic function revealed no dye retention.

The patient was given daily intravenous injections of 1,000 cc. of a 10 per cent dextrose and 1 per cent saline solution. His fluid intake was kept between 3 and 4 liters a day. Three transfusions were given, and he was put on an ulcer diet, together with restricted alkaline powders to control pain. On gastric analysis the total acidity was 34 and the free hydrochloric acid 0. Two weeks after admission the value for urea had fallen to 26 mg. per hundred cubic centimeters. The value for hemoglobin was 8.2 Gm. per hundred cubic centimeters, and erythrocytes numbered 3,500,000 per cubic millimeter of blood. The carbon dioxide combining power was 60.7 volumes per cent and the blood chlorides were 635 mg. per hundred cubic centimeters. The urine contained protein graded 1, and its specific gravity was 1.006. The patient was operated on and a perforating duodenal ulcer was found on the posterior wall. Posterior gastro-enterostomy was done, and convalescence was uneventful. Seven days after operation the value for blood urea was 35 mg. per hundred cubic centimeters, the urea clearance was 36.5 cc. of blood cleared per minute, sulphates were 5.9 mg. per hundred cubic centimeters, the carbon dioxide combining power was 47.5 volumes per cent, and the chlorides were 635 mg. per hundred cubic centimeters. Protein graded 1 persisted in the urine. The return of phenolsulphonphthalein was 35 per cent. These postoperative studies of renal function lead one to believe that a mild impairment of the renal function was present and that it was of fundamental importance in the production of alkalosis.

Case 6.—A man, aged 46, gave a history of duodenal ulcer of two years' duration, with hematemesis six weeks prior to his admission to the clinic; since then he had been taking from 8 to 10 teaspoonfuls of alkali powder a day. For about a week prior to admission he had vomited once or twice a day, and he had felt quite dizzy and weak most of the time. Nervousness, irritability, forgetfulness and frequent fronto-occipital headaches had been experienced during this period.

At the time of admission the urine contained protein graded 1, and its specific gravity was 1.013. The value for hemoglobin was 14.7 Gm. per hundred cubic centimeters, and erythrocytes numbered 4,060,000 and leukocytes 8,000 per cubic millimeter of blood. The value for urea was 130 mg., for creatinine 2.5 mg., and for chlorides 503 mg. per hundred cubic centimeters; the carbon dioxide combining power of the blood plasma was 72.1 volumes per cent. Analysis of the gastric content showed a total acidity of 80 and free hydrochloric acid of 56. The patient's condition did not permit roentgenologic examination of the stomach. Ten per cent dextrose and 1 per cent salt solution was administered intravenously daily, and the fluid intake was maintained at between 3,500 and 4,500 cc. daily. Seven days after the patient's admission the value for urea was 26 mg. per hundred cubic centimeters, the urea clearance was 48 cc. of blood cleared per minute, blood sulphates were 4.3 mg. per hundred cubic centimeters and the carbon dioxide combining power was 52.8 volumes per cent. The highest specific gravity of the urine was 1.026, the lowest specific gravity in the dilution test 1.004. The urine contained protein graded 1 in three of five tests. The total output of urine in twenty-four hours during this period ranged from 2,000 to 4,300 cc.

An exploratory operation was performed, and a subacute bleeding duodenal ulcer was found, for which duodenojejunostomy, reconstruction of the pyloric outlet, and knife excision of the ulcer were done. Convalescence was uneventful. It is difficult to say just how much renal injury was present at the time the value for urea was 130 mg. and that for creatine was 2.5 mg. per hundred cubic centimeters. There undoubtedly was renal insufficiency. However, the values were rapidly restored, so that in seven days all tests of renal function that were made gave normal values. One must conclude that renal injury in this case was acute but minimal in degree. The patient returned two years later, at which time urinalysis gave negative results and the value for blood urea was 34 mg. per hundred cubic centimeters.

Case 7.—A man, aged 46, gave a history of intermittent symptoms of duodenal ulcer for two years. On examination, the urine had a specific gravity of 1.028; it was negative for protein or casts. The value for hemoglobin was 17.2 Gm. per hundred cubic centimeters, and erythrocytes numbered 4,510,000 and leukocytes 5,100 per cubic millimeter of blood. Roentgenologic examination of the stomach revealed a duodenal ulcer. Analysis of gastric content showed a total acidity of 86 and free hydrochloric acid of 30. The value for blood urea was 20 mg. per hundred cubic centimeters.

The patient was given hourly feedings of milk and cream together with 16 Gm. of alkaline powders daily. On the fifth day after admission he complained of a dry mouth, of an aftertaste following ingestion of the powders, that the milk was sour, and of general malaise. On the seventh day he refused his milk because it made him sick. The value for blood urea was 20 mg. per hundred cubic centimeters. Urinalysis gave negative results. Cream soup, custard and cereals were given. All symptoms became worse. On the tenth day the patient vomited. At this time the value for urea was 50 mg. per hundred cubic centimeters, the urea clearance was 30 cc. of blood cleared per minute, the carbon dioxide combining power was 70 volumes per cent, and blood chlorides were 553 mg. and serum sulphates 9.2 mg. per hundred cubic centimeters. The powders were discontinued and mucin and tribasic calcium phosphate were given instead. On the fifteenth day the patient was free from symptoms. Studies of renal function at this time showed urea 26 mg. per hundred cubic centimeters, urea clearance 60 cc. of blood cleared per minute, blood sulphates 4.3 mg. per hundred cubic centimeters, and a return of phenolsulphonphthalein of 50 per cent. The dilution test revealed a good output of urine, with 1.001 as the lowest specific gravity. The test of hepatic function showed negative dye retention. Protein, casts and erythrocytes were absent in the urine during the entire period of observation.

It is difficult to explain the alkalosis in this case on the basis of previous renal impairment, since before and after the period of alkalosis no impairment of renal function was demonstrated.

COMMENT

Alkalosis is relatively uncommon in the treatment of peptic ulcer. However, the possibility of its occurrence should be kept constantly in mind. The phenomenon usually comes on gradually. The symptoms of distaste for milk, the patient claiming that it is sour, of headache and of weakness are constant, and they occur early. They are noted in the period of compensated alkalosis prior to the characteristic changes in blood chemistry that follow. Later, the other symptoms just referred to appear. Impaired renal function was demonstrated in all the cases during alkalosis. No data were available regarding the previous renal status of the patients. Two of the patients had definitely associated vascular changes.

It is important that the status of the kidneys should be determined in each case before the patient is placed on alkaline powders. If impairment exists, alkaline treatment will probably be unsatisfactory, as has also been pointed out by Jordan and Kiefer. In these cases alkalosis may be rectified by smaller doses of alkalis or by replacement of such alkalis with mucin or tribasic calcium phosphate, with satisfactory control of the symptoms and acids. It must, however, be remembered that administration of these substances may also result in toxemia. The mucin, being a protein, may in the presence of impaired renal function produce renal insufficiency. In case 7 renal studies gave normal results prior to and following alkalosis, yet with the ingestion of alkalis the carbon dioxide combining power rose to 70 volumes per cent and there was definite renal insufficiency. Neither does the development of alkalosis and renal insufficiency in case 6 seem to be explained by the assumption of a previous renal lesion for, subsequent to toxemia, the patient had normal renal function. The kidney has many functions, and it may be normal in one and deficient in another of these functions. Palmer and Henderson noted delayed excretion of alkali among individuals who apparently had normal renal function.

The question of injury of a normal kidney by prolonged administration of alkalis arises. The work of Addis and the MacKays has been referred to. Stieglitz[13] is of the opinion that renal injury may result from prolonged administration of alkalis. No definite observations have been made on man in this regard. Recently a patient with duodenal ulcer came under our observation who for years had consumed pounds of both calcium carbonate and sodium bicarbonate every week. No evidence of impaired renal function could be detected.

It is not implied in this paper that alkalosis cannot occur unless there is previous renal injury but rather that, in the presence of renal insufficiency, the threshold of safety is less, and not only that alkalosis is more easily produced in the presence of a preexisting renal injury but also that renal injury is increased concurrently with alkalosis, and thus a vicious cycle is set up. It is to be emphasized that neither basic nor acid salts can be administered with impunity in the presence of renal impairment.[14] In the presence of normal renal function, the buffer mechanism maintaining the acid-base equilibrium can absorb the assault of either acidifying or basic salts with little or no variation. Furthermore, one should not lose sight of the fact that the liver plays an important part in maintaining the acid-base equilibrium and that, in the presence of hepatic insufficiency, this is much more easily disturbed, as is evidenced by the intolerance, in cases of cirrhosis, to ingestion of either acid or basic salts.

SUMMARY

Seven cases of alkalosis were due to administration of alkali in the treatment of peptic ulcer. Evidence of impaired renal function was found in five cases after the alkalosis had been rectified. Previously impaired renal function is an important etiologic factor in alkalosis, and it should be considered in the treatment of peptic ulcer with alkali.

13. Stieglitz, E. J.: Alkalis and Renal Injury, Arch. Int. Med. 41: 10-17 (Jan.) 1928.
14. Singer, M. W., and Keith, N. M.: The Effects of Diuresis in Different Types of Edema, J. A. M. A. 101: 2009-2015 (Dec. 23) 1933.

CLINICAL SPECTROSCOPY

SEVENTY CASES OF GENERALIZED ARGYROSIS FOLLOWING ORGANIC AND COLLOIDAL SILVER MEDICATION, INCLUDING A BIOSPECTROMETRIC ANALYSIS OF TEN CASES

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The alarming increase of argyrosis leaves little doubt as to our purpose in this report. There has been an accumulation of indubitable clinical evidence which makes it imperative to present before those who prescribe, dispense or use these drugs the danger entailed therein. It must be emphasized that within the past year, following intranasal applications with Argyrol and Neo-Silvol in fifteen children under 10 years of age, an argyrosis developed. Ten of these fifteen children were girls. All these children will present throughout their lives a conspicuous and permanent bluish or slate-gray discoloration that will select them as objects of whispered comments by friends and strangers. At present there is no treatment for argyria.

The obvious responsibility for this injudicious medication rests with the circularized advertisements by the various manufacturers to the physicians; for example, they say:

> Argyrol solution, in any strength, may be used in the throat, nose and ear as often as the physician desires, with perfect safety and freedom from irritation. The usual method is to apply a 25 to 50 per cent solution once daily, and to give the patient a 10 to 25 per cent solution for home use in the atomizer in cases where home treatment is desirable. . . . Internal administration of argyrol, because of the fact that it is nontoxic, is extensively employed in the treatment of gastric ulcer, chronic gastritis, persistent vomiting, typhoid fever and ulcerative enteritis. One capsule, containing five (5) grains of argyrol, followed by a glass of water, should be administered two or three times daily. . . . Neo-Silvol is now quite generally recognized as a valuable therapeutic agent as attested by its growing bibliography and the increasing demand for it. . . . The injections of Silver-Salvarsan may be given every four days and continued until the desired therapeutic results have been obtained.

The Council on Pharmacy and Chemistry of the American Medical Association omitted argyrol from New and Nonofficial Remedies in 1928, with the following explanation:

> The firm presented no satisfactory evidence for the therapeutic claims in question and refused to mention the pharmacopeial name on the labels and advertising of Argyrol. The Council therefore voted to omit Argyrol from New and Nonofficial Remedies. . . . W. A. Puckner, Secretary.[1]

During the period from 1914 to 1928 thirteen cases of generalized argyria were reported following peroral, pharyngeal and intranasal treatment with organic and colloidal silver compounds. Since 1928, however, an additional twenty-seven cases have been reported and observed, or an increase of more than 100 per cent within the past five years. Approximately 30 per cent of the cases occurred in persons under 40 years of age and 20 per cent in children under 10 years of age. The sex distribution was about equal. Argyria developed

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1. Argyrol Omitted from N. N. R., Reports of the Council on Pharmacy and Chemistry, J. A. M. A. 90: 849 (March 17) 1928.

TABLE 1.—*Generalized Argyria Cases Following Peroral, Nasal and Pharyngeal Medication with Organic and Colloidal Silver Compounds*

	Case	Age	Sex	Method of Medication	Duration of Treatment	Appearance of Argyria	Medication*
Smith, C. H.: Arch. Dermat. & Syph. 16:68, 1927	I. M.	39	♀	Intranasal	3 years	1 years ago	I
Lundy, C. J.: Illinois M. J. 48:175, 1925	E. E.	49	♂	Intranasal	3 years	1 years ago	See II
Woodward, H. B.: Am. J. Dis. Child. 45:1005, 1933	L. V.	7	♀	Intranasal	4 years	Not known	See II
	R. C.	7	♂	Intranasal	2 years	Not known	See II
	J. R.	8	♂	Intranasal	6 years	1 years ago	See II
Boyntg, L. T.: J. Pediat. 1:732, 1929	O. L.	5	♀	Intranasal	Several years	1 years ago	See II
Wise, Fred: Personal communication to the authors	R. L.	4	♀	Intranasal	3 years	1 years ago	See II
Bristoe, Rustin: Personal communication to the authors	T. L.	4	♀	Intranasal	1 year	1 years ago	See II
	R. S.	5	♂	Intranasal	1 year	1 years ago	See II
Berkley, H. K.: J. A. M. A. 102:252, 1934	R. F.	10	♀	Intranasal	3 years	Not known	See II
	R. F.	7	♀	Intranasal	3 years	Not known	See II
Fraser, J. F.: Personal communication to the authors	D. S.	6	♀	Intranasal	4 years	1 year ago	See II
Hanlon, G. H.: Private patient	(a)	37	♂	Intranasal	1 months	1 years ago	See II
Tennant, G. V.: Personal communication to the authors	(a)	5	♀	Intranasal	Several years	Not known	See II
	(b)	5	♀	Intranasal	Several years	Not known	See II
	(c)	5	♀	Intranasal	Several years	Not known	Argyrol
	(d)	5	♀	Intranasal	Several years	Not known	Argyrol
Crispin, A. M.: J. A. M. A. 92:1924, 1929	.....	..	♂	Intranasal	4 years	Not known	Collargol
Weber, C.: Internat. Clin., Philadelphia, 1911, 1:170	.....	51	♀	Peroral	1 months	10 years ago	Collargol
Kobert, R.: Internat. Clin., Philadelphia, 1911, 1:165, 1908	Cases	..	..	Peroral	3-4 years	1 years ago	Collargol
Goldsmith, H. L.: J. A. M. A. 97:1304, 1931	Y. L.	35	♂	Pharyngeal	1 year	2 years ago	Argyrol
Barber, H. A.: Laryngoscope 40:185, 1930	E. C.	35	♀	Intranasal	3 years	1 years ago	Argyrol
Boothby, L. B., and Hussey, R.: Journ. M. J. 34:449, 1927	A. M.	39	♀	Peroral	1 years	1 years ago	Argyrol
Odell, A. G.: Clinics M. Bull. 15:1, 1928	(a)	..	♂	Intranasal	Several years	1 years ago	Argyrol
	(b)	40	♂	Intranasal (shortened)	2 years	Several years ago	Argyrol
Davis, T. D.: Virginia M. Monthly 58:104, 1931	(a)	..	♀	Peroral	Not known	Not known	Argyrol
	(b)	40	♀	Intranasal	Not known	Not known	Argyrol
	(c)	45	♀	Enema	11 years	Not known	Argyrol
Jones, M.: Laryngoscope 29:181, 1919	(a)	45	♀	Intranasal	3 years	1 years ago	Argyrol
Sollmann, A. W., and Lockhart, T. L.: Arch. Dermat. & Syph. 17:1, 1928	(a)	..	♀	Peroral	1 year	10 years ago	Argyrol
Jamieson, R. C.: Arch. Dermat. & Syph. 14:68, 1926	R. M.	35	♀	Intranasal (shortened)	10 months	Not known	Argyrol See II
Cheatle: Arch. Dermat. & Syph. 11:68, 1925	O. S.	39	♂	Pharyngeal	Several years	1 years ago	Argyrol
Kelly, I. D., cited by Weiss, H. B.: Arch. Dermat. & Syph. 8:1, 1923	(a)	..	♀	Pharyngeal	Several years	Not known	Argyrol
Fox, Howard: Arch. Dermat. & Syph. 22:824, 1930	H. H.	38	♀	Intranasal (shortened)	1 year	3 years ago	Argyrol
Wilson: Arch. Dermat. & Syph. 14:68, 1926	R. G.	40	♀	Intranasal	3 years	2 years ago	Argyrol
Wise, Fred: Arch. Dermat. & Syph. 22:1, 1930	M. P.	38	♀	Intranasal	1 years	1 years ago	Argyrol
Hansel, J. V.: Arch. Dermat. & Syph. 27:116, 1933	H. G.	31	♀	Nasal	1 year	1 years ago	Argyrol
	A. E.	37	♂	Pharyngeal	Many years	10 years ago	Argyrol
	A. E.	37	♂	Pharyngeal	Many years	10 years ago	Argyrol
	H. F.	33	♂	Intranasal	3 months	1 years ago	Argyrol
Schwartz, H. J.: Personal communication to the authors	H. F.	38	♀	Pharyngeal	Not known	Not known	Argyrol
Hanlon, G. H.: Private patient	F. E.	38	♀	Pharyngeal	Not known	Not known	Argyrol
Pusk, A. J.: J. A. M. A. 102:197, 1934	(a)	40	♀	Pharyngeal	Many years	Not known	Argyrol
	(b)		Mentioned as other cases				
	V. L.	7	♀	Intranasal	3 years	1 year ago	Argyrol

* Medication (Solis-Cohen, Solomon, and Gittleson, T. S.: Pharmacotherapeutics; Materia Medica and Drug Action, New York, D. Appleton & Co., 1933, pp. 713-714):

I. Lunosol, Argonol Chloridum Colloidale Sanderosum (U. S. P.): Colloidal silver chloride. A preparation of colloidal silver chloride containing 10 per cent of silver and 10 per cent of sucrose. Dose, used locally in solutions of from 1 to 10 per cent on any mucous membranes.

II. Neo-Silvol (U. S. P.): A compound of silver iodide with a soluble gelatin base, containing from 16 to 21 per cent of silver iodide in colloidal form. Dose, used in aqueous solutions of from 2 to 5 per cent.

III. Collargol, Collargolum, Argentum Credé, Colloidal Silver, Argentum Colloidale (U. S. P.): Colloidal silver and silver oxide formed by reduction and stabilized by derived egg-albumin, with which it is partly combined. It contains silver equivalent to approximately 70 per cent metallic silver. Dose, by mouth, 0.065 to 0.325 Gm., or as 1:120 to 1:240 solution (colloidal operation) 0.5 Gm.

IV. Argyrol, argyn, mild protargol, mild silver protein, Argonin-Proteinsilber salbe (U. S. P. X): Silver rendered colloidal by the presence of a combination with protein. It contains not less than 19 per cent and not more than 23 per cent of silver. Dose, nose and throat sprays, from 10 to 20 per cent; swab, from 20 to 30 per cent; by mouth, 0.3 Gm.

TABLE 2.—*Generalized Argyria Cases Following Intravenous Silver Arsphenamine Therapy*

	Case	Age	Sex	Duration of Treatment	Number of Injections	Appearance of Argyria	Dosage in Gm.
Hall[8]	(a)	37	♂	Jan. 31, 1919 to Oct. 31, 1919	45	July 1920	23.00
Engel[9]	(a)	33	♀	February 1919 to February 1920	31	Not given	Not given
Becker[9]	(a)	33	♂	4 years	60	November 1920	31.50
	(b)	33	♂	2 years	37	1 years ago	17.50
Spiegel[7]	A. W.	33	♂	1 years	18	May 1920	7.50
	F. H.	34	♂	1 years	21	September 1920	9.50
	M. W.	30	♂	1 years	24	November 1920	10.50
Cannon, A. B.: J. A. M. A. 102:253, 1934	(a)	34	♂	5½ years	60	1½ months after last injection	7.50
	(b)	32	♂	9½ years	82	1 month after last injection	10.50
	(c)	35	♂	4 years	60	10 days after last injection	10.50
	(d)	33	♂	6½ years	100	11 months after last injection	15.00
Smith, A. R.: Personal communication to the authors	W. G.	33	♂	3 years	60	Not known	6.30
	C. E.	39	♂	1 year	..	6 months after last injection	.....
Tilney, Frederick: Personal communication to the authors (patients treated by family physician)	H. H.	44	♂	7 years	120 plus	2 months ago	.....
	E. W.	41	♀	6 months	Not known	Not known	.....

in 65 per cent following pharyngeal and intranasal applications, and in 35 per cent following peroral administration. The duration of the local and systemic treatment varied from one month to eleven years. Neo-Silvol was used in 20 per cent, Collargol in 22 per cent, and Argyrol in 55 per cent of the cases (table 1).

Silver arsphenamine was introduced clinically in March 1918 as another drug in the treatment of syphilis. Its effectiveness was attributed to the presence of two chemotherapeutic agents—arsenic and silver—and possibly a third rôle—the catalytic action of silver of the arsphenamine molecule. A number of syphilologists have recognised silver arsphenamine as a potent drug in the treatment of late cerebrospinal syphilis and advocate its use. Other syphilologists have looked askance at this drug because of the danger of inducing

a therapeutic argyria. Five years after the introduction of silver arsphenamine, Sioli[2] and Kogoj[3] each reported a case of generalized argyria following the use of this drug. The opinions of different observers are not in agreement concerning the maximum dose that can be given without inducing an argyria in the patient. That disagreement undoubtedly explains the development of an argyria in thirteen cases following silver arsphenamine during the last two and a half years (table 2). Habermann,[4] Sioli[2] and Mucha[5] stated that argyria might occur after 15 Gm. of silver arsphenamine had been administered but that this condition was not to be feared before this amount had been injected. Myers and Corbitt[6] were of the opinion that the possibility of argyria from silver arsphenamine is extremely remote. Spiegel[7] stated that many of his patients during the past eight years have received up to 12 Gm. of silver arsphenamine either alone or in combination with compounds of mercury and bismuth and that no discoloration of the skin has taken place. In the summary and conclusions, he stated that silver arsphenamine could not be given to exceed a total dosage of 8 Gm., because of the possibility of producing argyria. Becker[8] believes that the administration of 18 Gm. or more of silver arsphenamine is apt to be followed by argyria.

A survey of the dosage recorded in table 2 immediately suggests an unrecognized factor. In some patients a discoloration developed after 4, 7 or 8 Gm., in others not until 10, 15 or 20 Gm. had been injected. The reason for this obvious lack of uniformity will be explained in the ensuing part of this report.

TABLE 3.—*A Biospectrometric Analysis of Ten Cases of Generalized Argyria Classified According to the Quantity of Silver Present*

Cases	Age	Sex	Source of Silver	Degree of Discoloration	Site of Biopsy	Quantity of Silver*
1. H. E.	39	♀	Argyrol	Very light	Left knee	4 Gm.
2. B. W.	41	♀	Silver arsphenamine	Very light	Shoulder	8 Gm.
3. C. F.	48	♂	Argyrol	Very light	Right thigh	8 Gm.
4. E. G.	44	♀	Argyrol	Light	Right arm	10 Gm.
5. M. L.	57	♂	Argyrol	Moderate	Left knee	10 Gm.
6. A. E.	57	♂	Argyrol	Deep	Left knee	15 Gm.
7. W. G.	61	♂	Silver arsphenamine	Deep	Right thigh	15 Gm.
8. I. K.	49	♂	†	Deep	Forehead	15 Gm.
9. E. K.	36	♂	Argyrol	Very deep	Shoulder	18 Gm.
10. H. M.	44	♂	Silver arsphenamine	Very deep	Right leg	20 Gm.

* The quantity of silver in the biopsy specimens was expressed as grams equivalent of silver arsphenamine irrespective of the source, inorganic or organic, from nasal, pharyngeal, peroral or intravenous administration. It was convenient to use this designation, since an earlier publication (Gaul, L. E., and Staud, A. H.: Clinical Spectroscopy: A Study of Biopsies from Patients Who Have Received Intravenous Injections of Silver Arsphenamine, Arch. Dermat. & Syph. 180:433 [Sept.] 1934) established that the quantity of silver in the biopsy specimen was directly proportional to the total dosage of silver arsphenamine.

† The origin of silver was traced to the electrolytic action between a gold and a silver filling in contact in the mouth. Electrical measurements in additional patients and a subsequent biospectrometric analysis proved that the gold and silver fillings in a medium of saliva form a galvanic cell the action of which causes the silver to go into solution. The rate of solution is determined by such factors as the p_H value of the saliva, the surface area of the fillings and electrode potentials.

2. Sioli, F.: Vier Jahre Paralysebehandlung mit Silbersalvarsan und Salbeiöspritzt, Arch. f. Psychiat. 60:321, 1923.

3. Kogoj, F.: Argyrie und Arsenomelanose der Haut und Schleimhäute nach Silber und Neosalvarsan, Acta. dermat.-venereol. 4:95 (March) 1923.

4. Habermann, R.: Ueber Argyrie cutis nach Silbersalvarsan und den Wert der Leuchtbildmethode E. Hoffmann für ihren Nachweis, Dermat. Ztschr. 40:65 (Jan.) 1924.

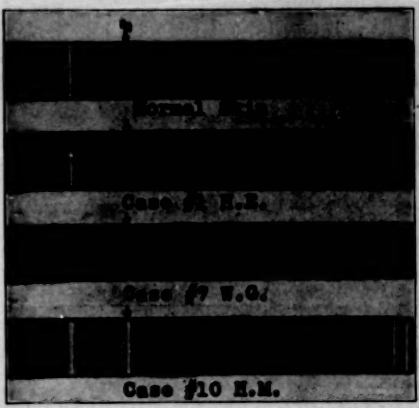
5. Mucha, cited by Habermann: Congress of the German Dermatologic Society, Munich, May 20-24, 1923.

6. Myers, C. N., and Corbitt, H. B.: II. Retention and Elimination of Silver with Special Reference to Silver Salvarsan and Silver Therapy, Am. J. Syph. 8:704 (Oct.) 1924.

7. Spiegel, Leo: A Discoloration of the Skin and Mucous Membranes Resembling Argyria Following the Use of Bismuth and Silver Arsphenamine, Arch. Dermat. & Syph. 28:266 (Feb.) 1933.

8. Becker, S. W., and Bleiler, E. B.: Argyria Following the Excessive Use of Silver Arsphenamine, J. A. M. A. 97:389 (Aug. 5) 1931.

It is first necessary to explain the normal occurrence of silver in human tissue. The remarkable achievements in physics, chemistry and metallurgy that introduced the utilization of the mineral elements in the earth's crust have been responsible for the present metal age. These achievements as never before in the history of man offer innumerable sources for the contamination of foodstuffs and water with extraneous metals. Silver has chemical and physical properties that makes it especially suitable in the manufacture of culinary ware, cutlery, casseroles and various appliances to facilitate



Selected biospectrograms illustrating the correlation between the density of the silver line and the degree of skin discoloration.

Case	Degree of Discoloration of Normal Skin	Grams Equivalent of Silver Arsphenamine
1. H. E.	Very light	4 Gm.
7. W. G.	Moderate	15 Gm.
10. H. M.	Very deep	20 Gm.

All density measurements were made with a Moll recording microphotometer, type A. The method by which these measurements were made have been described in an earlier publications (Gaul, L. E., and Staud, A. H.: Arch. Dermat. & Syph. 30:433 [Sept.] 1934; Clinical Spectroscopy: The Advantages and Physical Principles of the Spectrograph and the Technic for Obtaining the Dermal Biopsy Specimen for a Biospectrometric Analysis, ibid., to be published).

the preparation of foods. While the daily intake of silver from the use of silver or silver-plated appliances is infinitesimal in amount, the total increment from chemical action and mechanical friction over a period of years or decades becomes a sizable amount. Another potential source of silver in human tissue is given in the footnote in table 3.

These remarks have been verified by a series of more than 500 biospectrometric analyses.[9] An analysis of twenty biopsy specimens obtained from children varying in age from 6 months to 2 years established the normal density of the silver line. In this group of biospectrograms[10] the silver line was faintly visible or visible only with a hand lens. A series of biospectrograms representative of the successive decades of life showed a silver line the density of which was directly proportional to the respective decade from

9. The word biospectrometric specifies a quantitative spectrographic analysis for the metallic constituents in differentiated and undifferentiated mesoderm, obtained by performing a dermal biopsy with a three-sixteenths inch (0.47 cm.) punch, the biopsy specimen weighing approximately 0.025 Gm.

10. The word biospectrogram specifies the spectrogram given by burning a biopsy specimen under standardized physical conditions and obtained with three-sixteenth inch (0.47 cm.) dermal punch.

which the biopsy specimen was obtained. In approximately 5 per cent of the biospectrograms the density of the silver line was an equivalent to that given by a biopsy specimen from a patient who had received from 2 to 5 Gm. of silver arsphenamine.

About the most suitable way of explaining the lack of uniformity in dosage in patients in whom argyria has developed following silver arsphenamine therapy is to cite the following example: Let us assume that a white man, aged 50, presents symptoms, signs and laboratory data of late cerebrospinal syphilis. All objective signs of argyria are absent. Normally an individual in the fifth decade of life has a silver retention an equivalent of from 1 to 2 Gm. of silver arsphenamine. If during the past any inorganic or organic silver compounds have been used, either as peroral, nasal or pharyngeal medication, the quantity of silver retained will be greatly increased. Supposing the patient had a silver retention equivalent to 5 Gm. of silver arsphenamine. The syphilologist, unaware of this, prescribes a routine course of silver arsphenamine. After a total dosage of 7 Gm. of silver arsphenamine had been given, an argyria developed. If the syphilologist had been aware of a 5 Gm. silver retention by the patient, the total dosage could have been calculated accordingly and the argyria prevented.

The example just cited should explain the lack of uniformity of the total dosage in a patient with argyria following the administration of silver arsphenamine. It is possible that the cases in which argyria appeared after 4, 7 and 8 Gm. may have shown an existing silver retention before treatment was instituted (table 2). If the syphilologist knows the silver retention, which can now be determined by a biospectrometric analysis, there should be no additional cases of argyria from silver arsphenamine.

A biospectrometric analysis of ten cases presenting objective signs of argyria led to the formulation of the following theorem: The degree of the discoloration is directly dependent on the duration and the intensity of solar or artificial radiation and the quantity of silver present. Argyria becomes clinically apparent after a silver retention approximating an equivalent of 8 Gm. of silver arsphenamine, shown in the accompanying illustration. Naturally, whether a person is a blond or a brunette, the normal pigmentation will be a further factor modifying the degree of discoloration; another less important modifying factor is the amount of subcutaneous fat. The discoloration in argyria appears first on the exposed areas: face, neck, hands—lunula of the nails—as a result of the chemical action of light on the retained silver.

The pathologic changes in argyria as well as the histochemical studies have demonstrated a uniform distribution of the silver throughout connective tissue.[10a] Since the corium of the skin is of mesodermic origin or connective tissue, the biopsy specimen will contain the same quantity of silver in the same patient irrespective of the site from which it is obtained; i. e., a biopsy specimen obtained from the area of discoloration and one obtained from the leg or thigh showing no discoloration will contain equal quantities of silver in the same patient (table 3, site of biopsy).

Clinical spectroscopy has not only been successful in establishing the quantity of silver necessary to produce an argyrosis but has been equally successful in demonstrating the presence of gold,[11] lead [12] and nickel [13] in biopsy specimens.

10a. Gaul, L. E., and Staud, A. H.: Clinical Spectroscopy: The Quantitative Distribution of Silver in the Body or Its Physiopathologic Retention as a Reciprocal of the Capillary System, to be published.

CONCLUSIONS

1. Seventy cases of argyria have been observed and reported following the indiscriminate use of organic and colloidal silver compounds.

2. The degree of discoloration is directly dependent on the duration and the intensity of solar or artificial radiation and the quantity of silver present.

3. Argyria becomes clinically apparent after a silver retention approximating an equivalent of 8 Gm. of silver arsphenamine.

4. A biospectrometric test supplies the syphilologist with a method for determining the silver retention before and during silver arsphenamine therapy.

5. The total silver retention irrespective of the origin should never exceed 7 Gm. equivalent of silver arsphenamine.

6. A biospectrometric analysis offers a new diagnostic test for the identification of an argyrosis.

PERIARTERITIS NODOSA

REPORT OF A CASE WITH FATAL PERIRENAL HEMORRHAGE

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Periarteritis nodosa is an unusual and relatively uncommon vascular disease. As late as the middle of 1933 only 195 verified cases were to be found in the medical literature.[1] Seventy-seven of these had been reported after 1926. Kussmaul and Maier[2] in 1866 made the first anatomic description of the disease. In 1878 Meyer[3] described a triad of symptoms characteristic of periarteritis nodosa: first, chlorotic marasmus; second, polymyositis and polyneuritis, and, third, gastrointestinal symptoms. Brinkmann[4] and Christeller[5] later emphasized nephritis as a fourth cardinal symptom. Arkin[6] in 1930 described in detail the pathologic lesions.

The case reported here presented a clinical picture simulating an acute surgical condition of the kidney so closely that nephrectomy was performed.

REPORT OF CASE

First Entry.—T. M., a married man, aged 29, a tilesetter, admitted to the University of California Hospital in the medical teaching service, March 30, 1931, complained of intermittent

11. Gaul, L. E., and Staud, A. H.: Clinical Spectroscopy: A Study of Biopsy Material Taken from Patients Receiving Gold Sodium Thiosulphate, Arch. Dermat. & Syph. 28:790 (Dec.) 1933; Clinical Spectroscopy: The Quantitative Distribution of Gold in the Body or Its Physiopathologic Retention as a Reciprocal of the Capillary System, ibid., to be published.

12. Gaul, L. E., and Staud, A. H.: Clinical Spectroscopy: A Spectrometric Analysis of Biopsy Specimens Obtained from Cases of Plumbism and Workmen in Daily Contact with Lead Paints, J. Nerv. & Ment. Dis. 81:265, 1935.

13. Gaul, L. E. and Staud, A. H.: Clinical Spectroscopy: The Quantitative Retention of Nickel in Psoriasis, Arch. Dermat. & Syph. 30:697 (Nov.) 1934.

From the Departments of Medicine and Pathology of the University of California Medical School.

1. Rothstein, J. L., and Welt, Sara: Periarteritis Nodosa in Infancy and in Childhood, Am. J. Dis. Child. 48:1277 (June) 1933.

2. Kussmaul, A., and Maier, R.: Periarteritis Nodosa, Deutsches Arch. f. klin. Med. 1:484, 1866.

3. Meyer, P. S.: Ueber Periarteritis nodosa oder Multiple Aneurysmen der mittleren und kleineren Arterien, Virchows Arch. f. path. Anat. 74:277, 1878.

4. Brinkmann: Zur Klinik der Periarteriitis nodosa, München med. Wchnschr. 69:703 (May 12) 1922.

5. Christeller, E.: Arch. f. Verdauungskr. 37:249, 1926.

6. Arkin, A.: A Clinical and Pathological Study of Periarteritis Nodosa, Am. J. Path. 6:401 (July) 1930.

pain in the lumbar region for seven years, and headache, anorexia and weakness for one year.

The patient had the usual childhood diseases, without complication, before the age of 10 years. His second decade was medically uneventful except for gonorrheal urethritis at the age of 14 years and "reinfections" at 17, 18 and 20 years. The patient's father, living at the age of 48, had "high blood pressure"; his paternal grandfather also had had "high blood pressure."

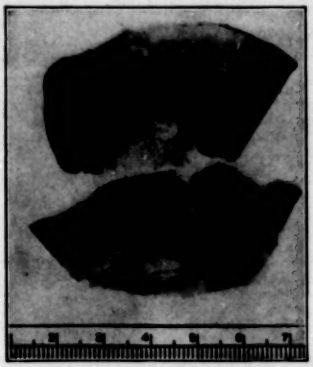

Fig. 1.—Sections of the kidney removed surgically (cleared by Spalteholz method). The lower section shows an aneurysm ruptured through the cortex as the source of hemorrhage. The upper section shows two aneurysms at the bifurcation of an artery.

In 1923, at the age of 22, the patient had a series of furuncles on the back of the neck, relieved following the use of autogenous vaccine. Approximately one month later there appeared, in the course of a few days, a gradually increasing pain across the lumbar region, with swelling of the underlying tissue. The patient was confined to bed for one month, during which time the pain and swelling gradually subsided. He was told at the time, as an incidental finding, that he "had high blood pressure." During the subsequent six years he felt well except for occasional attacks of sore throat and occasional nocturia and diurnal frequency. Tonsillectomy was done in 1929, with relief of the sore throats.

During 1930 there were frequent severe occipital and frontal headaches, commencing usually at midday and relieved by a night's rest. Anorexia, vague aching pains in the lumbar region and easy fatigability were noted. Quite suddenly in January 1931 the patient was seized with a severe pain in the lumbar region. Urinalysis at the time showed red blood cells in the sediment. The pain gradually subsided. In the subsequent two months persistent headaches, weakness and loss of weight from 140 pounds to 118 pounds (from 63.5 to 53.5 Kg.) led the patient's physician to advise study in a hospital for a suspected renal stone or renal infection.

Physical examination on entry showed that the patient was fairly well developed and in no discomfort. The retinal vessels showed marked sclerosis; the retina of each eye was pale, with scattered white spots around the macula and over the retina. Some of these white patches appeared to be depressed, resembling scars of former hemorrhages. No fresh hemorrhages were seen. The heart was moderately enlarged to the left and the sounds were very forceful. The second sound at the aortic area was accentuated and there was a soft systolic murmur at the mitral area. The rhythm was regular, the rate 110 per minute. The blood pressure was 235 systolic and 150 diastolic. The peripheral vessels showed marked thickening. The prostate was slightly enlarged, more marked on the left, with areas of focal induration.

The red blood cell count was 5,200,000 per cubic millimeter; the hemoglobin, 90 per cent (12.6 Gm.); the white blood cells, 13,100, and the differential showed polymorphonuclears, 74 per cent; polymorphonuclear eosinophils, 1 per cent; large lymphocytes, 2 per cent; small lymphocytes, 21 per cent; monocytes, 2 per cent. The nonprotein nitrogen of the blood was 33 mg. per hundred cubic centimeters. The blood Wassermann reaction was negative. Urinalysis showed albumin varying from a faint trace to a heavy trace. The urinary sediment contained from 1 to 3 white blood cells and 1 or 2 red blood cells per high dry field, and an occasional granular cast. The total excretion of phenolsulphonphthalein in two hours was 49 per cent. Cystoscopy showed an old stricture in the posterior urethra and mild generalized hyperemia of the bladder wall. Culture of the bladder urine showed Staphylococcus albus. Culture of urine from the renal pelves was negative. Dye excretion from each kidney at the end of the first fifteen minutes, after intravenous injection, was 13 per cent. Roentgen study of the left kidney, after injection of sodium iodide through the ureteral catheter, showed the organ to be normal in appearance except in the upper calix, where some changes were noted but which were thought to be due to overdistention.

During the patient's eighteen-day stay in the hospital there was an irregular daily elevation of the temperature to a maximum of 37.8 C. (100 F.). The pulse rate was rapid. The blood pressure remained elevated. Symptomatically the patient improved. On discharge he was advised to continue moderated activity, a low protein low-salt diet, prostatic massage and bladder irrigations. The diagnosis on discharge was marked arteriosclerosis and hypertension, chronic nephritis of the arteriosclerotic type, chronic prostatitis and cystitis.

Shortly after discharge the pain in the lumbar region recurred and persisted with moderate severity throughout the next three months. Weakness and headache were progressive and the patient also noted rapidly failing vision. Distention of the abdomen, nausea, vomiting and constipation became prominent. The blood pressure remained elevated to about 210 systolic and 140 diastolic.

August 22, the evening before the second entry, the patient was sitting quietly in a chair when he was suddenly seized with a severe pain in the right lumbar region. The pain was intense and sharply localized for several hours, and the overlying muscles seemed to be "tied into a knot." The position of flexion was most comfortable. Chiropractic manipulations were administered and relieved the muscle spasm slightly, but there was considerable soreness in the lumbar region and a pain was noted in the lower right quadrant of the abdomen. A physician

Fig. 2.—Longitudinal section through the left kidney showing aneurysmal dilatation of the arteries.

was called, who administered opiates and advised immediate removal to the hospital.

Second Entry.—On this entry, August 23, the patient was restless, irritable and markedly undernourished. He appeared to be acutely ill and complained of acute pain in the right lumbar region. The skin and mucous membranes were pale. Both ocular fundi showed hazy disk margins. The disks and surrounding retinas were paler than normal and the small tortuous arteries appeared almost bloodless. Patches of white exudate surrounded the vessels, and about the maculae there

were star-shaped patches of exudate. The carotid pulsations were forceful. The heart was enlarged to the left. The first heart sound was split in a sharply localized area at the apex. The second sound was markedly accentuated, especially at the aortic area. No murmurs were heard. The rhythm was regular. All the palpable peripheral vessels were markedly thickened. The blood pressure was 185 systolic and 125 diastolic. On palpation the abdominal wall was rigid and tender. An irregular mass was identified in the right upper quadrant, apparently extending through the depth of the abdomen. The right lumbar region was exquisitely tender both to superficial and to deep palpation. The spine was held immobile by the rigidity of the paravertebral muscles on the right.

Fig. 3.—Right internal mammary artery and vein. The large nodules were embedded in the intercostal space. Communication of these nodules with the arteries could not be demonstrated. The smaller nodules were in communication with the arteries. They had thick fibrous walls with a minute central blood clot. Occurrence of the nodules at the bases of the branching arteries may be noted.

The red blood cell count was 1,800,000 per cubic millimeter; hemoglobin, 30 per cent (4.2 Gm.); white blood count, 15,400 per cubic millimeter, with a differential of polymorphonuclears, 79 per cent; polymorphonuclear eosinophils, 1 per cent; lymphocytes, 18 per cent, and monocytes, 2 per cent. The smear showed achromia. The nonprotein nitrogen of the blood was 46 mg. per hundred cubic centimeters. Repeated urinalyses showed albumin in amounts varying from a moderate to a heavy trace. The urinary sediment contained hyaline and granular casts and frequent white blood cells but no red blood cells. The total excretion of phenolsulphonphthalein in two hours was 30 per cent. Repeated examination of the stools for occult blood was negative. Cystoscopy showed diffuse injection of the bladder wall with a trigonitis. Roentgen study of the right kidney, after injection of sodium iodide through a ureteral catheter, showed the renal pelvis to be normal except that it was displaced outward. It changed position very little when the patient was in the vertical position. There was a suggestion of a rounded soft tissue shadow down the right side of the spine. Study of the colon with a barium enema was negative. On roentgen study the chest, heart and lungs appeared normal.

There was gradual slight improvement in the patient's condition during the first thirteen days of residence. A persistent irregular fever with the maximum to 38 C. (100.4 F.), a continuously rapid pulse rate, persistent leukocytosis, the presence of the abdominal mass, and the pain in the lumbar region led to a diagnosis of perirenal abscess and were considered indications for operation.

The patient was transferred to the genito-urinary service of Dr. Frank Hinman. A right nephrectomy incision was made and a large firm mass bulged into the wound. The tense perirenal fat was broken through with the expulsion of a large amount of clotted blood. The hematoma was found to be in and beneath the perirenal fat and infiltrated about the kidney. A right nephrectomy and adrenalectomy were performed. The source of the hemorrhage was not found. There was no untoward bleeding during the operation and the renal fossa was dry when the wound was closed.

Following the operation a transfusion of 525 cc. of whole blood was given from a compatible donor. For several hours thereafter the patient appeared to be in good condition. Eight hours after the operation he complained of severe abdominal pain and presently went into shock. Two hours later he died of respiratory failure in spite of supportive measures.

PATHOLOGIC STUDY

The specimen, consisting of the kidney surrounded by a mass of blood clot, weighed 450 Gm. The kidney, when dissected away from the clot, weighed 130 Gm. There were fragments of the adrenal gland in the blood clot. On cut section, numerous dilated thrombotic vessels were noted in the renal cortex. One of these had ruptured through the capsule and was probably the source of the perirenal hemorrhage (fig. 1). The renal tissue was coarsely granular and the arteries were thick walled. The histologic changes corresponded to those to be described in the postmortem tissues.

The necropsy was performed eleven hours after death. There was a slight baldness on the crown of the head. The left axillary lymph nodes were palpable. There was a recent unhealed incision in the right lumbar region, closed by sutures.

When the abdomen was opened, the cecum was seen to be pigmented with fine black particles, which proved to be recent subserosal hemorrhages. There were several encapsulated masses of dry blood in the mesentery. The viscera otherwise appeared to be normal in size and position.

When the thorax was opened three nodules about 8 mm. in diameter were noted along the course of the internal mammary artery (fig. 3). These all contained old dry blood. The pleura and pericardium were normal.

The heart weighed 400 Gm. Two gray, firm, translucent nodules 0.5 cm. in diameter were observed on the anterior surface of the right ventricle. These nodules lay in contact with an artery. On section they were seen to be completely organized and had no lumens. There were no valve defects. The coronary arteries were not sclerosed. There was extreme left ventricular hypertrophy without dilatation. The left ventricular wall was 30 mm. thick; the right was 4 mm.

The lungs were relatively normal. The dependent parts were moderately congested. No nodules were noted.

The liver weighed 1,800 Gm. It was pale yellow except for several depressed red areas on the surface. These areas were irregular in outline. The largest one was 4 cm. in diameter. On section the lobular architecture was distinct except in areas of intense congestion, such as those noted on the surface. These areas usually had a very thick walled artery in their center. There were also numerous encapsulated masses of old dry blood similar to those occurring in other organs. These were aneurysms and usually occurred at the side of a thick walled artery. Communication with the lumen of the artery was not observed. The hepatic artery was small and cordlike, without a visible lumen.

The spleen weighed 185 Gm. It was pale pink and rather soft. One large and several small aneurysms were present in the parenchyma. The large one was 2 cm. in diameter.

Fig. 4.—Cross section of pancreas showing an aneurysmal dilatation of the splenic artery, compressing the pancreas.

The splenic artery was opened along its course. There was a very marked atherosclerosis. The plaques were soft and were conspicuous in size and thickness at the mouths of the arterial branches, so that the orifices of the branches were very small. Encapsulated masses of dry blood occurred in nodules along the course of the splenic artery. These nodules did not appear to have arisen within the pancreas but encroached on it.

The stomach was dilated, containing about 120 cc. of watery fluid. There were a few congested vessels in the submucosa. Two encapsulated masses of hemorrhage were found beneath the mucosa. The largest one was about 2 cm. in diameter. Its periphery was bright yellow, while the center was dark red. Along the course of the right gastro-epiploic artery and the left gastric artery were many small nodules. Some contained dried blood and some were completely fibrosed. The

nodules were nearly always at or near the root of a branching vessel. A few nodules were found in the mesentery. There were no other lesions in the alimentary tract. The posterior peritoneum was pushed forward by the perirenal hemorrhage. This mass of hemorrhage extended from the diaphragm to the brim of the pelvis. It filled the whole right flank and extended a little over to the left side.

The ligatures at the hilus of the amputated kidney were examined in situ and found securely tied. The middle right

Fig. 5.—Artery showing the intimal proliferation and infiltration with eosinophils.

adrenal artery projected as a stump into the mass of hemorrhage. There was a nodule just proximal to the severed end of the artery. This adrenal stump was the apparent source of the last hemorrhage. Fragments of the adrenal gland were found in the mass of hemorrhage. As far as could be determined, the gland was normal except for fragmentation. Three nodules containing old blood occurred along the course of the middle adrenal artery on the left side.

The left kidney was pale. The surface was finely granular. It appeared to be within normal limits in size. The structures at the hilus were normal in their relations. The renal artery was moderately sclerosed. On section, a number of nodules were found throughout the kidney (fig. 2). These were never more than 8 mm. in diameter. In some the dry blood was red and in others brown. The bladder and prostate appeared to be normal. There was a small unencapsulated area of brown pigmentation, apparently old blood, in one testis.

The aorta and the iliac arteries showed moderate sclerosis, with athermatous plaques along the intima.

The arteries at the base of the brain showed a well marked atherosclerosis. When an attempt was made to tie one of the internal carotids, the vessel broke repeatedly under the suture. No hemorrhages or nodules were found in the brain. The skeletal muscles and eyes were not examined.

For brevity the microscopic appearance of the lesions in organs other than the kidneys will be described only as they showed some change not present in the kidneys.

Both kidneys showed a slight diffuse fibrosis. The glomeruli were little changed. Occasionally there was some fibrin and serum in the capsular space. The capsules were slightly to moderately thickened. The tubular epithelium was degenerated in some fields, and in a few areas the tubules were dilated by hyaline casts. Small recent infarcts were noted. There was a conspicuous intimal thickening of the arterioles, with a corresponding reduction in the size of the lumen (figs. 5 and 6). Several aneurysmal nodes occurred. They had walls comparable to those of medium sized arteries. In some instances the thin hyalinized wall was concentrically dissected apart by recent hemorrhage (fig. 7). In the walls of these nodes, one rarely found a stippling of calcium (fig. 8). A lymphocytic infiltration of the wall was common. Rarely a few polymorphonuclear leukocytes were found in and about the walls dissected by hemorrhage. Hemosiderin-laden macrophages were present. The lumens of some of the nodes showed early stages of organization. At the periphery of the older nodes the blood pigment was collected and stained a bright orange (hematoxylin-eosin stain). The right perirenal hemorrhage showed early organization.

In the heart and along the splenic artery, some of the lesions appeared to be more recent. In the nodes along the coronary arteries, hyalin necrosis of the muscularis occurred. Repair of the vessel wall was evidenced by fibroglial proliferation. Eosinophils were scattered throughout the wall and around the nodules on the splenic artery. The lesions of the splenic and coronary arteries appeared to be more recent than those of the kidney.

The anatomic diagnosis was: 1. Periarteritis nodosa involving the mesenteric, hepatic, splenic, renal, adrenal, gastric, cardiac and internal mammary arteries. Recent right nephrectomy; extensive right perirenal hemorrhage. 2. Arteriosclerosis, most extensive in the pancreatic, splenic and cerebral arteries.

COMMENT

The duration of the clinical symptoms of this disease is said to be from a few weeks to six months, rarely a year. However, in one of the instances reported by Arkin[6] the patient lived four years after his one and only attack of acute illness. When he eventually died, from cardiac and renal insufficiency, histologic evidence of old healed lesions of periarteritis nodosa were found at autopsy. Seven years before his death our patient had an acute illness which might be interpreted as an acute exacerbation of this disease. The finding of a hypertension at the time of this first illness is presumptive evidence at least of the presence of the disease at that time. There was then a long period of freedom from symptoms, during which time it may be assumed

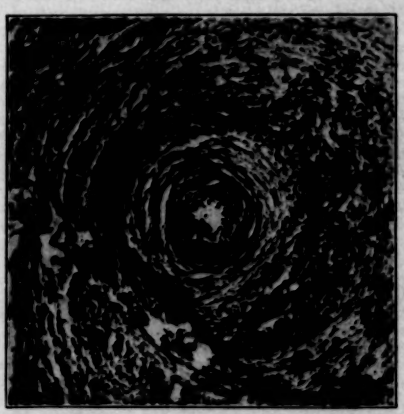

Fig. 6.—Artery showing intimal proliferation.

that the lesions underwent healing and the disease became quiescent.

Our patient was referred to the hospital by his private physician because of a suspected renal stone. After the first period of observation a diagnosis of chronic nephritis was made. Six months later a diagnosis of perirenal abscess seemed justified and an operation was performed. A perirenal hematoma was found and the kidney with the surrounding hematoma was

removed. The patient died ten hours after the operation from another massive hemorrhage into the renal fossa. On studying the histories of other patients with periarteritis nodosa it is found that all these diagnoses have been made, erroneously, from time to time.

The frequent involvement of the kidney in this disease has been emphasized by Gruber,[7] who found an incidence of 74 per cent involvement, and by Arkin,[8]

Fig. 7.—Wall of an artery showing hemorrhage and organization.

who found an incidence of 80 per cent involvement. The usual clinical signs pointing to the kidney are those of a nephritis and consequently the most frequent clinical diagnosis has been "hemorrhagic nephritis." Acute surgical conditions of the kidney have been diagnosed occasionally. In two of the cases reported by Hauser,[8] operations were performed because of a mistaken diagnosis of an acute surgical condition of the kidney. Gray [9] reported a case in which a preoperative diagnosis of perinephric abscess was made. The patient died five days after operation and the lesions of periarteritis nodosa were found at autopsy. Keegan [10] reported a case in which a "surgical condition of the kidney" was suspected, and the operative specimen showed the changes of periarteritis nodosa. Wordley [11] reported a case in which a diagnosis of renal calculus was made and then later changed to renal neoplasm. When the patient died about two months after the onset of the illness, autopsy again showed the lesions of periarteritis nodosa. In at least eight cases of periarteritis nodosa found in the literature,[12] death has been due to renal or perirenal hemorrhage.

Goldstein and Wexler [13] have described the pathologic changes in the retinas of a patient dying with periarteritis nodosa. Although the fundi of their patient were reported as being normal during life, the authors suggested the possibility of ophthalmoscopy being of aid in recognizing the periarteritis nodules on the choroidal vessels of other patients. Gruber [14] tabulates thirteen cases with ophthalmoscopic examinations. All these patients had renal lesions. In eight of them the fundi were reported as normal and in three an albuminuric retinitis was described, so he concluded that the changes were secondary to the renal lesions. Friedenwald and Rones [15] have made pathologic studies of the retinas in periarteritis nodosa and found that the vessels showed an extreme degree of arteriosclerosis and did not differ in any way from those found in an ordinary uncomplicated albuminuric retinitis. The ophthalmoscopic picture thus far described in patients with periarteritis nodosa does not seem to be characteristic of the disease, but it is possible that in some cases correct diagnosis may be attained by the finding of tubercle-like lesions on the choroidal vessels. On the other hand, this finding might serve to confuse the diagnosis by bringing up the possibility of tuberculosis. In our case the retinal changes were described by the consulting ophthalmologist as being those of albuminuric retinitis. The long standing hypertension, with its resulting sclerotic changes, and the nephritis would readily explain the picture. Unfortunately, a pathologic study of the retinas was not made.

Herrman [16] has noted changes in the roentgenograms of the chest of a patient with periarteritis nodosa. He felt that these changes were probably due to vascular and perivascular inflammation and exudation together with associated congestion and small infarcts. He was

Fig. 8.—Wall of an artery showing deposits of calcium and fatty acid.

of the opinion that confirmation of these changes in other patients with the disease is necessary before they can be considered characteristic of the disease. Roent-

7. Gruber, G. B.: Kasuistik und Kritik der Periarteriitis nodosa, Zentralbl. f. Herz- u. Gefässkr. 18: 198, 1926.
8. Hauser, H.: Beitrag zur Frage der Periarteritis nodosa, Frankfurt. Ztschr. f. Path. 36: 22, 1928.
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10. Keegan, J. J.: Primary Vascular Nephritis or Renal Periarteritis Nodosa, Arch. Int. Med. 30: 189 (Aug.) 1925.
11. Wordley, E.: A Case of Cortical Necrosis of the Kidney, Lancet 2: 927 (Oct. 27) 1923.
12. Schmidt, J. E.: Ueber Periarteriitis nodosa, Beitr. z. path. Anat. u. z. allg. Path. 43: 455, 1908. Walter, H.: Beiträge zur Histopathogenese der Periarteritis nodosa, Frankfurt. Ztschr. f. Path. 25: 306, 1921. Jansen, P.: Zur Klinik der intrarenalen Aneurysmen, Ztschr. f. urol. Chir. 10: 130 (July) 1922. Mertens, E.: Ueber Periarteriitis nodosa mit Massenblutung ins Nierenlager, Klin. Wchnschr. 1: 1841 (Sept. 9) 1922. Harris, W. H., and Friedrichs, A. V.: Periarteritis Nodosa, with Classification of the Pathology, J. M. Research 43: 285 (June-July) 1923. Löwenberg, W.: Beitrag zur Klinik der Periarteritis nodosa, Med. Klin. 19: 207, 1923. Laus, F. J.: Zur Klinik der Periarteritis nodosa, Mitt. a. d. Grenzgeb. d. Med. u. Chir. 38: 582, 1925. Powell, R. E., and Pritchard, J. E.: Periarteritis Nodosa with Report of a Case Involving One Kidney, Brit. J. Urol. 4: 317 (Dec.) 1932.

13. Goldstein, Isadore, and Wexler, David: The Ocular Pathology of Periarteritis Nodosa, Arch. Ophth. 2: 288 (Sept.) 1929.
14. Gruber, G. B.: Zur Frage der Periarteriitis nodosa, Virchows Arch. f. path. Anat. 255: 441, 1925.
15. Friedenwald, J. S., and Rones, Benjamin: Some Ocular Lesions in Septicemia, Arch. Ophth. 5: 175 (Feb.) 1931.
16. Herrman, W. G.: Pulmonary Changes in a Case of Periarteritis Nodosa, Am. J. Roentgenol. 29: 607 (May) 1933.

genographic studies of the chest of our patient showed the lung fields to be clear.

The general symptoms of this disease are those of any acute or chronic sepsis. The local manifestations are extremely variable because they are governed by the site of localization of the vascular lesions. Correct diagnosis during life is therefore very difficult. According to Rothstein and Welt,[1] only seventeen cases out of 195 (8.7 per cent) have been diagnosed accurately during life from the microscopic examination of a subcutaneous nodule removed by biopsy (twelve cases) or of a specimen removed at operation (five cases). In seven other cases a tentative diagnosis based on clinical symptoms alone was made and subsequently proved by autopsy.

At the present time it appears that the hope for more accurate diagnosis of periarteritis nodosa during life lies in the recognition of the existence of such a disease by the clinician and the inclusion of it in the differential diagnosis of unusual medical and surgical problems. Rothstein and Welt[1] aptly stated that "periarteritis nodosa should be considered in every case of acute or chronic sepsis with sterile blood cultures and a bizarre symptomatology unexplainable on a common basis, particularly if associated with a severe anemia, a febrile course, gastro-intestinal symptoms, manifestations in joint, muscle or skin and signs of renal involvement together with an elevated blood pressure."

The etiology of periarteritis nodosa is obscure. Various theories have been advanced, the most acceptable of which proposes that the disease is infectious in origin. The very nature of the pathologic lesions suggests an infectious etiology. At the present time neither a filtrable virus nor a nonfiltrable micro-organism has been demonstrated as the causative agent. Culture of a smear taken from a mesenteric nodule at the time of autopsy of our patient showed Staphylococcus albus. As the autopsy was performed eleven hours after death, there was probably adequate time for organisms from the gastro-intestinal tract to invade the surrounding tissue.

The pathologic studies suggest that the causative agent has a predilection for arteries. It produces a patchy destruction of the media. The lesions tend to heal but complete morphologic and functional recovery does not take place. An aneurysm may develop in the weakened wall, or the lumen may be reduced or obliterated by the scar. The aneurysms, when they occur, may be completely walled off from the circulation and may show organization throughout. The lesions are not all in the same stage of the disease at the same time.

In this case the aneurysms were frequently found at the bases of the small arteries immediately distal to the point of branching from larger vessels. A tentative mechanical explanation of this finding is suggested by the fact that the intravascular pressure in the branching artery is highest at its base and diminishes progressively toward the periphery. The wall of the damaged vessel would be most likely to give way and form an aneurysmal dilatation in the region of greatest internal pressure. Forbus[17] has noted the occurrence of miliary aneurysms of the cerebral arteries at the angle formed by a branching vessel and has demonstrated a defect in the muscularis layer of the arterial wall, in normal and pathologic cases, at the point of bifurcation of the vessel.

Nieberle[18] has called attention to a disease found in deer, cattle, swine and dogs very similar or identical to periarteritis nodosa in man. Experimental studies with these animals might aid in clarifying the etiology and natural course of the disease.

SUMMARY

1. A diagnosis of perirenal abscess was made on a patient with a mass in the upper right quadrant of the abdomen, pain in the lumbar region, fever and leukocytosis. An operation was performed and a perirenal hematoma was found. The patient died a few hours after operation from a second hemorrhage into the renal fossa.

2. Necropsy revealed the characteristic lesions of periarteritis nodosa involving the mesenteric, hepatic, splenic, renal, adrenal, gastric, cardiac and internal mammary arteries.

3. The history suggests that the duration of the disease in this patient was seven years.

4. The pathologic study showed that the aneurysmal dilatations were most frequently found at the base of a branching vessel.

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17. Forbus, W. D.: On the Origin of Miliary Aneurysms of the Superficial Cerebral Arteries, Bull. Johns Hopkins Hosp. 47:239 (Nov.) 1930.

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A CASE OF SPONTANEOUS HEMOPNEUMOTHORAX

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Hemopneumothorax is not a common condition. The majority of cases follow trauma, either in military or in civil life, but the spontaneous form is distinctly rare. After a scrutiny of the literature for the last thirty-four years I have been able to find only thirteen recorded cases.

Ten of these reported cases deserve to be called spontaneous for lack of any definite cause, such as demonstrable disease or trauma. The remaining three were due to tuberculosis and one of them was complicated by artificial pneumothorax. Among the ten spontaneous cases three were fatal and seven patients recovered; of the three tuberculous patients, two recovered and the one with artificial pneumothorax died. These thirteen cases are all true cases of hemopneumothorax and not just hemothorax or pneumothorax. The term hemopneumothorax should be applied to cases of lung collapse with undoubted blood and air within the pleural cavity and not just blood-stained serum (hemorrhagic effusion), such as is occasionally seen in malignant disease of the lung.

THIRTEEN CASES FROM THE LITERATURE

CASE 1.—Dr. G. Newton Pitt,[1] who recorded a case in 1900, states that "there is no reference to hemopneumothorax in the Index Catalogue of the United States Library, nor is it discussed in any of the standard treatises on medicine in English, French or German," and at that time he could find only one case in the literature unassociated with trauma. This case was recorded in the Guy's Hospital records and revealed a case of hemopneumothorax due to the rupture of an aneurysm in a large phthisical cavity at autopsy. Pitt's patient was a young man, who was seized with sudden pain in the right shoulder and who collapsed. There were signs of fluid and air in the right side of the chest. A Southey's tube was inserted into the sixth space in the right axilla, with the removal of blood and

air. Death ensued the same day. Autopsy revealed no tuberculosis and the only abnormality was a pleural adhesion and an emphysematous bulla, which had ruptured. The adhesion from the bulla to the pleura was torn across. No obviously patent vessel could be seen, but the adhesion was suggested as a probable source of the bleeding.

Case 2.—Sir Humphry D. Rolleston,[2] also in 1900, reported another case: A young man was seized with pain in the right shoulder and right hypochondrium. The abdomen was resistant and did not move well; the liver dulness was normal. Twenty-five hours after the acute onset he was in extreme collapse and with a pulse of 160, running in character and irregular. Three days later the signs were those of a pneumothorax. On the following day the trocar of an aspirator was inserted into the sixth interspace in the right anterior axillary line; a tube attached to the trocar was brought up under water. Although the chest was hyperresonant, only dark blood came out. As it appeared possible that the trocar had passed into the liver and drawn off blood from a large branch of the portal vein, it was withdrawn and again introduced in the fifth right interspace in the parasternal line. Air then came bubbling out at high pressure from the tube under water; as the air escaped it was followed by dark blood, which also came out at considerable pressure. The patient died eight days from the onset. At autopsy the right pleural cavity contained 60 ounces (1,775 cc.) of dark fluid blood, with a few ounces of blood clot. There was no evidence of lung rupture, no tuberculosis, no leakage from the pulmonary artery; there were normal glands of the chest, normal intercostal and internal mammary arteries, and no signs of scurvy in the joints, with no evidence of the source of blood or air into the pleural cavity.

Case 3.—Ness and Allan[3] in 1910 reported that a clerk, aged 31, was seized with pain and tightness in the left side of the chest, and dyspnea. There were marked signs of hydropneumothorax. A thoracentesis was done and 5 ounces (148 cc.) of blood mixed with serum was removed. No further thoracentesis was done. Six weeks after admission all signs had disappeared and the patient went back to work. Three months later he was perfectly well. Examination of the sputum always gave negative results.

Case 4.—Thomas Bushby[4] in 1913 reported the case of a youth, aged 17, with a spontaneous hemopneumothorax with collapse. The chest was tapped twice and bloody fluid removed each time, following which signs of pneumothorax persisted for a while and finally ended in recovery and discharge. There was some suspicion of the patient being of a hemorrhagic diathesis, which was supported by the fact that troublesome bleeding had occurred on the occasion of the extraction of teeth and that he had bled freely from small wounds. The case was regarded as one of rupture of the lung, probably due to a small superficial cavity with simultaneous laceration of a small vessel.

Case 5.—Charles Spencer Williamson[5] in 1917 reported that a young man, while drinking water over a faucet, felt something "crack" in the left side of the chest, with pain and signs of collapse, coming on gradually. The signs of hydropneumothorax with succussion splash and coin sound were elicited. During several months the chest was aspirated twelve times with from 12 ounces (355 cc.) to 1 liter of bloody fluid being removed each time. Cultures of the fluid remained sterile. Inoculation of the fluid into a guinea-pig did not lead to the development of tuberculosis in the animal. Tumor was ruled out. No sputum was obtainable. The patient's recovery was uneventful. In spite of all the negative tests, Williamson expressed the belief that the pneumothorax was caused by either a small emphysematous bleb or a small focus of tuberculosis. The hemorrhage he explained as "old adhesions in the vicinity of the apex with perhaps development of ectatic veins or a miliary aneurysm.

Case 6.—Krause and Heise[6] in 1920 reported an unusual case of tuberculosis terminating in spontaneous hemopneumothorax following artificial pneumothorax. The autopsy revealed, on the anterior surface of the lung, 5 mm. away from an adhesion, a small hole about 2 mm. in diameter in the center of an umbilicated area that was 8 mm. in diameter. This umbilicated area consisted of pleura reduced to the thinnest of tissue paper, which then sank down into the depression made by a small subpleural vomica, which it overlay and which was about the size of a cherry. The hole in the center of this area led directly into this cavity. However, the bleeding point could not be made out definitely.

Cases 7 and 8.—G. A. Allan[7] in 1925 reported two cases. Neither patient had suffered trauma and both recovered:

A man, aged 20, a steel worker, was seized with a sudden sharp pain in the left side of the chest. Six hours later he had a complete collapse. Signs of pneumothorax with succussion splash, tinkle and amphoric echo were present, and dulness posteriorly. Exploratory aspiration of the chest revealed pure blood. After eighteen days the patient recovered. About ten months later a roentgenogram of his chest was taken, which was reported on by Dr. Riddell as follows: "The appearances indicate a distinct, slight tuberculous lesion near the base of the left lung. There also appear to be very slight scattered lesions on the right side." The patient's history also showed that he had previously been treated for pleurisy.

A man, aged 38, had preliminary pains in the right shoulder blade for one day, which ceased if he sat down or ate a meal. The same evening he was seized with a sudden, sharp pain on the right side of his chest, felt faint and almost collapsed. Examination disclosed an amphoric murmur, a succussion splash, a tympanitic percussion note and shifting dulness. Heart dulness was heard 2 inches to the left of the left nipple line. Exploratory puncture of the right side of the chest revealed pure blood. Strapping of the chest gave the patient relief and he made a rapid recovery. A roentgenogram taken about five months after the attack was reported on by Dr. Riddell as follows: "The right side is distinctly less translucent than the left. The lung is not fully expanded, but the space is less translucent than the lung; there is probable fluid present. I am of the opinion that tuberculosis is present in the upper half of the right lung." On the roentgen examination in both cases it seems safe to assume that both patients were tuberculous, although both recovered and were able to resume work.

Case 9.—Doria[8] in 1928 reported the case of a young man seized with pain in the right shoulder and shortness of breath. Diagnosis of hydropneumothorax was made and 400 cc. of air was removed. Eight days later, because of increasing pain and dyspnea, 200 cc. of bloody fluid was removed. Bloody fluid was removed several times and replaced by nitrogen to prevent further bleeding. The patient recovered in about three months and was well two years later.

Case 10.—Lewis M. Hurxthal[9] in 1928 reported the case of a young man seized with pain in the right shoulder, shortness of breath and pallor. Blood and air were found in the right side of the chest. On the third day, 2,400 cc. of venous-like blood was removed from the chest and replaced with an equal amount of air. This procedure was repeated once, about a week later. The patient soon recovered and was well after an interval of four months.

Case 11.—Arthur H. Terry Jr.[10] in 1930 reported a case in which a man, aged 34, was seized with pain in the left shoulder, dyspnea and collapse. He had an attack of pleurisy five years previously. A diagnosis of hydropneumothorax was made. Fourteen ounces (414 cc.) of blood was removed from the left side of the chest. Three days lated 530 cc. of dark red, bloody fluid, mixed with air, was removed. The patient improved. Later, dyspnea and cyanosis returned. The patient was placed in an oxygen tent, with improvement. He was discharged three months after the onset. One year later he was perfectly well. Roentgen examination revealed the chest normal.

Case 12.—A. T. Milhorat[11] in 1931 reported that a man, aged 20, felt a sudden, sharp steady pain in the left shoulder, while riding comfortably in the subway. Eleven months previ-

2. Rolleston, H. D.: Tr. Clin. Soc. London **33**:96, 1899-1900.
3. Ness, R. B., and Allan, G. A.: Brit. M. J. **1**:744 (March 26) 1910.
4. Bushby, Thomas: Brit. M. J. **2**:1624, 1913.
5. Williamson, C. S.: M. Clin. Chicago **1**:1159-1173, 1917.
6. Krause, A. K., and Heise, F. H.: Am. Rev. Tubere. **3**:788 (Feb.) 1920.
7. Allan, G. A.: Clin. J. **54**:440 (Sept. 16) 1925.
8. Doria, R.: Riforma med. **44**:552 (May 7) 1928.
9. Hurxthal, L. M.: New England J. Med. **198**:687 (May 17) 1928.
10. Terry, A. H., Jr.: New York State J. Med. **30**:1100 (Sept. 15) 1930.
11. Milhorat, A. T.: Am. J. Surg. **13**:315 (Aug.) 1931.

ously he had had a pleurisy without effusion on the left side. Twelve hours after the onset of the symptoms a pain developed in the midepigastrium which spread over the entire abdomen and was most severe just below the xiphoid cartilage and in the right lower quadrant. There were signs of pneumothorax with a definite succussion splash. Rigidity of the abdomen suggested the possibility of an acute abdominal surgical lesion, but after a careful and complete physical examination had been made it was felt that the abdominal pain, rigidity and tenderness were secondary to the condition in the thorax. Exploratory thoracentesis of the left chest yielded pure blood, which was sterile on culture. Seven thoracenteses in all were performed, with the removal of from 400 to 500 cc. of bloody fluid each time until after the fifth procedure, when the fluid had become so viscid that only from 60 to 150 cc. could be obtained. The patient was discharged fourteen weeks after the onset of his illness, only a small amount of fluid remaining. Repeated sputum examinations, fourteen in all, showed no acid-fast organisms. Six months after his discharge the patient had gained weight and was doing very well.

CASE 13.—E. Gerard Housden and Allen Piggot[12] in 1931 reported that a man, aged 44, who had had a "winter" cough for the previous nine years, was seized with an exceptional attack of coughing lasting a full half hour, which exhausted him and was followed by pain in the left side of the chest.

Fig. 1.—Pneumothorax, September 18.

Fig. 2.—Increase of fluid, September 27.

Fig. 3.—Fluid level, October 13.

Two days later he resumed work but had to return home because the pain had become severe, and he went to bed at 3:30 p. m. At 8:30 p. m. he had to evacuate the bowels. Following defecation the pain became intense and he collapsed. His condition gradually became worse and the patient died the following evening. Postmortem examination revealed air and 2 pints of blood in the left pleural sac and a firm pleural adhesion attached to an emphysematous cavity at the apex of the left lung. The adhesion appeared to have been torn away from the chest wall during life and it seems quite possible that it was from the torn adhesion that bleeding took place. On removal, the left lung was found to be entirely airless. There were also present, near the apex, two subpleural blebs. These intercommunicated and opened out into a small thin-walled, smooth cavity. There was no caseous matter present in the cavity, and it appeared to be formed by the coalescence of many emphysematous dilatations. The authors state that they are inclined to the view that the abnormalities found in the lung post mortem indicated the source both of the pneumothorax and of the hemorrhage, and that the strain caused by the violent attack of coughing and again later by defecation played a part in the production of the spontaneous hemopneumothorax.

AUTHOR'S CASE

History.—W. K., a man, aged 30, single, an upholsterer, admitted to the Medical Department of the Misericordia Hospital Sept. 17, 1933, discharged Nov. 1, 1933, took a very warm bath two nights before admission and retired. While in bed, toward morning, he experienced a severe pain in the right side of the chest accompanied by difficult breathing. He stated that he could not take a full breath because of the pain in his chest, and he was somewhat wary of taking a full breath because of the pain caused thereby. He also stated that he had had, for the past two weeks, a severe cold accompanied by running of the nose and frequent severe cough. During this two weeks period he had not consulted a physician. The pain in the chest continued the following day, i. e., the day before admission, gradually increasing in severity, especially on deep breathing or coughing, so much so that twenty-four hours after the initial attack of pain I was called and had to administer morphine. The patient was advised to go to the hospital at once but decided to wait until morning, entering the hospital approximately thirty hours after the onset of his illness.

He was unable to recall his childhood diseases except two attacks of pneumonia. Five years before he had an attack of grip, which was mild and from which he fully recovered. There was no history of tuberculosis. He had never undergone an operation, not even tonsillectomy.

He had a moderate appetite, with some irregularity in taking meals. The bowel movements were fairly regular; he never required a cathartic or laxative. He smoked twenty cigarets a day.

The family history was good and there was no history of tuberculosis.

Examination.—On inspection of the chest, respiratory lung excursion was good on the left side but showed impeded mobility on the right side. On percussion the left chest percussion note was good, with no areas of dulness or consolidation and no tympanitic note. On the right there was a marked tympanitic note. No dulness was noted in the right side except for a small area around the sternal margins and around the clavicle and right base. On auscultation an amphoric breath sound was heard in most of the right lung. No râles were heard in the left side of the chest, and breath sounds were clear on the left side. The coin sound and succussion splash were both present on the right side.

Nutrition was good, with good muscular development. The patient stated that he lost about 5 pounds (2.3 Kg.) during the past month.

The facial expression was anxious. He was pale. There were no scars or evidence of injury on the face or head. The pupils were round, even and equal, reacting normally to light and in accommodation.

There was slight deviation of the septum.

The ears were normal.

The lips were of good color and not dry. There were no fissures or sores.

The tongue was very badly coated and furred.

There was much dental gold work and many teeth were missing. The mucous membrane of the oral cavity was intact. There were no areas of patches, sores or ulcerations.

12. Housden, E. G., and Piggot, Allen: Brit. M. J. 2:941 (Nov. 21) 1931.

In the neck there were no palpable lymph glands. The thyroid was not palpable.

The apex of the heart was clearly visible and palpable, slightly outside the left nipple line. The sounds were regular and of good force. There were no irregularities, murmurs or friction rub. The aortic second and pulmonic second sounds were both normal. Heart dulness was shifted slightly to the left, the apex one-half inch to the left of the nipple line.

There was marked rigidity of the abdomen in the right upper quadrant and the liver dulness area was markedly diminished, even on deep percussion, especially on the upper border. The liver was not palpable.

Fig. 4.—Appearance of chest, October 21.

There was no dysuria. There was a very faint trace of albumin in the urine. No pus or casts were found. No pain was present in either kidney area.

Examination of the skin, the bones and joints and the glands gave negative results.

The reflexes were normal to stimuli.

The impression and provisional diagnosis were pneumohydrothorax.

A roentgenogram (fig. 1) taken on the day of admission showed a complete pneumothorax on the right side with a complete collapse of the lobes of the right lung. The mediastinal shadow, including the heart, was shifted slightly to the left and the left lung fields showed a diminution in the amount of aeration; there was considerable amount of fluid in the right base.

The roentgen diagnosis was complete pneumothorax of the right side of the chest, with hydrothorax.

Treatment and Course.—The patient was given codeine for the cough and pain, one-half grain (0.03 Gm.) every four hours. His temperature remained around 100 F. and his pulse varied from 90 to 100, and at no time during his stay in the hospital did his temperature exceed 101 or his pulse 100. Enemas were given for evacuation and, in spite of this, defecation materially increased the pain in the chest, which was felt mostly in the region of the right shoulder and down the right arm. The following day, September 19, the patient had less pain and was able to sleep several hours that night. His condition did not change materially and on September 27 a second roentgen examination was made (fig. 2), which still showed complete collapse of the right lobes; the only difference from the previous examination was the increase in the amount of fluid in the right thorax. The left lung fields still remained clear.

As the patient's condition was comparatively good and as the true character of the fluid within the chest was not suspected up to this time, it was decided to treat him expectantly. A third film taken October 13 (fig. 3) demonstrated the right lung to be more than half aerated, with the fluid level extending up to the third rib anteriorly. The heart and trachea showed a moderate displacement to the left side.

The diagnosis was hydropneumothorax, with evidence of more fluid at this examination.

It was decided to do a thoracentesis, and on October 14, under procaine hydrochloride anesthesia, 420 cc. of bloody fluid was removed from the right side of the thorax, specimens of which were sent to the laboratory for guinea-pig inoculation, for smears and for culture. The withdrawal of fluid had to be interrupted on reaching 420 cc. because of an attack of syncope. The laboratory examination of these specimens revealed many red blood cells on direct smear, with only a few scattered lymphocytes and polymorphonuclear leukocytes. No bacteria were seen. A culture was sterile after seven days. The results of guinea-pig inoculation were reported on November 25. Fragments of the liver and the spleen removed from a guinea-pig that had been injected five weeks previously with bloody fluid from the thorax gave no gross evidence of tuberculosis. Sections taken through the liver and spleen showed no evidence of tuberculosis.

The blood Wassermann reaction with alcoholic antigen and with cholesterinized antigen was negative.

Sputum, obtained with great difficulty, was negative for tubercle bacilli on two separate examinations.

The patient rallied quickly from his syncope but felt fairly weak for twenty-four hours. He was given hot liquids and external heat. A blood count, October 18, showed hemoglobin 82 per cent, red blood cells 5,200,000, white blood cells 14,000, polymorphonuclears 58 per cent, lymphocytes 32 per cent. No abnormal cells were seen. October 20 a fluoroscopic examination showed the fluid level up to the second interspace in the right side of the chest. On inspiration the fluid rose to the height of the first interspace. It was determined to do a further thoracentesis and accordingly on October 21, with procaine hydrochloride anesthesia, 800 cc. of bloody fluid was aspirated from the right side of the thorax. The film immediately following the aspiration (fig. 4) demonstrated a hazy shadow involving the lower half of the right lung field, which could be the result of a thin layer of fluid or of a moderately thickened pleura. There was no evidence of a new growth of either lung field. The mediastinum and heart were in the midline at this time.

Within the next few days the patient had slight pain in the right chest and examination disclosed audible friction sounds anteriorly and moderate dulness at the right base posteriorly, which was interpreted as being due to a thickened pleura and some fluid. The patient's condition gradually improved until November 1, when he was discharged from the hospital for further convalescence at home. Examination at the hospital, just previous to his discharge, still showed friction sounds on the right side and slight dulness at the base posteriorly.

A subsequent chest film, which was taken November 28 (fig. 5), demonstrated the lung fields to be clear with no evidence of a tuberculosis or pneumonic process on either side. The heart was small, and globular in type.

Fig. 5.—Lung fields clear, November 28.

The roentgen examination gave results within normal limits. There was no evidence of the previously reported hydropneumothorax (hemopneumothorax) of the right lung.

In May 1934, six months after his discharge and seven and one-half months after the onset of illness, his condition was very satisfactory. He has been working at his trade as an upholsterer since the first of January and feels no discomfort. He has gained about 8 pounds (3.6 Kg.).

COMMENT

This case, as well as the thirteen reported previously, is of interest because of the hemorrhage accompanying the pneumothorax. Pitt in his report cites Pagenstecher's experiments, which showed that the pleurae, similar to the blood vessels, are capable of keeping contained blood fluid for a long time and that the production of clotting is, similarly to that of thrombosis,

often started by a lesion of the walls. Two hours after blood was injected into the pleural cavity experimentally it was almost always fluid; after six hours there was a fluid resembling blood in appearance, but it would not clot. No inflammatory changes were induced. The pleurae, therefore, can keep the blood fluid but not unaltered. A considerable portion of the fluid is absorbed. In his experiments blood in the pleura was absorbed in a fortnight, but Wintrich concluded that a traumatic hemothorax required from six to twenty-eight days to absorb.

Pitt, in the same article, cites Blumenthal,[13] who in 1868 collected fifty-five reported cases of nontraumatic hemothorax, which he classified as follows: (1) tubercle, nineteen cases; (2) secondary to other diseases, fifteen cases; (3) primary, nine cases; (4) malignant disease of the pleura, twelve cases. An examination of the notes shows that there was an effusion of blood in only three of the so-called primary cases and in five of the malignant, and that in almost all the others the fluid was only stained with blood.

Pitt further classifies pneumothorax as follows:

1. Punctured wounds of the thorax. Laceration of the lung or bronchi by compression of the chest or by fractured ribs. A punctured wound of the lung will not produce hemothorax unless an important vessel is injured, but the smallest puncture may be sufficient to produce a pneumothorax.
2. Perforation of tuberculous cavities. This is by far the most common cause.
3. Empyema opening into the lung.
4. Abscess of the chest wall opening inward.
5. Perforating gastric ulcer, with a subdiaphragmatic abscess, burrowing upward.
6. Gangrene of the lung.
7. Acute abscess of the lung.
8. Bronchiectasis.
9. Pulmonary apoplexy with gangrene.
10. Hydatid.
11. Rupture of an emphysematous bulla. This has occurred in men apparently perfectly healthy and has often ended in recovery. Fraentzel[14] also has pointed out that the rupture may occur as the result of violent physical effort, in one case as the result of attempting to lift a heavy cask, and in a case of Findlay's after attempting to stoop down backward.
12. Tracheotomy. This occurs when the operation does not relieve the obstruction or when the tube has been accidentally pushed down in the connective tissue to one side of the trachea, or even when the incision is a very low one. An emphysema takes place into the connective tissue of the anterior mediastinum and then a rupture occurs, allowing the air to pass into the pleura.
13. Perforations of the esophagus.

Having considered all the possible causes of both hemothorax and pneumothorax per se, I will now examine the four cases of hemopneumothorax that came to autopsy, among the previously reported thirteen cases, namely, Pitt's, Rolleston's, Heise and Krause's, and Housden and Piggot's cases, to see whether any conclusion can be drawn from these as to the probable factors at work in the production of hemorrhage besides pneumothorax and collapse of the lung. Three of these showed a torn pleural adhesion and a torn or ruptured emphysematous bulla, Rolleston's case being the only one that at autopsy showed no definite cause for either the pneumothorax or the hemorrhage into the pleural cavity.

13. Blumenthal: Hémothorax non-traumatique, Thèse de Paris, 1868.
14. Fraentzel, in Ziemssen's Cyclopaedia of the Practice of Medicine 4:739.

Housden and Piggot, in the discussion of their case, emphasize the fact that they incline to the view that in Pitt's case and Krause and Heise's case, as well as their own case, the torn pleural adhesion and ruptured emphysematous bulla accounted for both the hemorrhage and the pneumothorax.

One other significant fact stands out clearly in all the fourteen cases, the present one included, and that is that all these victims of hemopneumothorax were males, a satisfactory explanation for which is lacking.

CONCLUSIONS

1. In a case of spontaneous hemopneumothorax, with recovery, in a young man, and thirteen collected cases from the literature, no definite etiology is demonstrable, but three of the previously reported cases point strongly to a torn pleural adhesion and a ruptured emphysematous bulla or bleb as the cause.
2. All cases reported, including the present one, occurred in the male.
3. Aspiration of the blood is the procedure of choice.
4. The condition is exceedingly rare.

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DIPHTHERIA OF THE PENIS

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Diphtheria of the penis is a rare disease. A careful review of the literature reveals none reported at as early an age as my patient.

In 1930 Hoyne and Levy,[1] in reporting a case of diphtheria of the penis in a 7 year old boy, reviewed the literature, which disclosed only fifteen similar reports. The first cases of diphtheria of the penis were reported in 1897 and, strangely enough, by three different observers in a period of a few months.

Munn,[2] in February 1897, reported three cases of this disease. One was in a 5 year old boy who developed the condition following circumcision. There were no cultures taken, and diphtheria antitoxin was not administered. The infection cleared up under local treatment. Another was in a 9 months old infant who was circumcised, following which a membrane developed at the site of operation which on culture showed Klebs-Loeffler bacilli. The mother was then suffering from faucial diphtheria. Thirty-five hundred units of diphtheria antitoxin was administered to the baby, but it died of toxemia and generalized hemorrhages. His third case occurred following circumcision in a 3 months old baby whose mother and brother had diphtheria. One thousand units of antitoxin was administered, with recovery.

In October of the same year Post[3] reported a case of diphtheria of the penis in a young adult whose wife, child and brother-in-law had diphtheria. No antitoxin was given to this patient, and ciliary paralysis of both eyes and postdiphtheritic paralysis of all four extremities developed.

Later that year, November 1897, McCollom[4] reported two cases. One was in a 4 year old boy who had scarlet fever and nasal diphtheria; diphtheria of the prepuce

1. Hoyne, A. L., and Levy, A. J.: Diphtheria of the Penis, J. A. M. A. 94:1393 (May 3) 1930.
2. Munn, W. P.: True Diphtheria of Penis, Pittsburgh M. Rev. 11: 43 (Feb.) 1897.
3. Post, A.: Diphtheria of Prepuce, J. Boston Soc. M. Sc. 1:6 (Oct. 19) 1897.
4. McCollom, J. H.: Two Cases of Diphtheria of Penis, J. Boston Soc. M. Sc. 1:22 (Nov. 16) 1897.

developed. Cultures were positive for Klebs-Loeffler bacilli, but antitoxin was not administered. His second case was in a 1½ year old boy with laryngeal diphtheria, in whom diphtheria of the penis developed although he had been circumcised several months before.

The next case appeared in the literature ten years later, when O'Brien,[3] in October 1907, reported the occurrence of diphtheria of the glans penis in a 13 months old baby three days following circumcision.

Fig. 1.—Appearance of penis seventeen days after circumcision, showing diphtheritic membrane.

The same year Beatty[6] reported diphtheria of the glans penis in a 3 year old boy with faucial and laryngeal diphtheria who had been circumcised four weeks previously.

Riva-Rocci,[7] in the same year, described two cases of diphtheria of the penis in two boys, aged 1 and 4 years. The former was in contact with a sister who had diphtheria. Both recovered following the administration of diphtheria antitoxin.

In 1912 Kolmer[8] reported two cases following circumcision, one in an 18 months and another in a 2 year old boy. Both recovered following the administration of diphtheria antitoxin, 7,200 and 4,800 units respectively.

Prinzing[11] in 1928 reported the occurrence of diphtheria of the penis in a man, aged 28, whose wife had a positive vulval and throat culture.

Vasile,[12] in the same year, told of a case in a boy, aged 16 months, who had not been circumcised. Thirty thousand units of diphtheria antitoxin was administered in two injections.

In 1929, Schmidt[13] reported a diphtheritic infection of a wound of the penis and scrotum in a man.

Hoyne and Levy,[1] in 1930, reported the occurrence of diphtheria of the glans penis in a 7 year old boy, circumcised in infancy, who also had oral and nasal diphtheria.

In 1931 Molteni and Casazza[14] reported a diphtheritic infection of the glans penis in an infant.

A total of eighteen cases of penile diphtheria have been reported in the medical literature, fifteen in children and three in adults. One half were confirmed by culture and many patients recovered without the use of diphtheria antitoxin, so that the authenticity of the presence of the specific disease might be questioned. That patients with diphtheria may recover without antitoxin is not doubted, but one speaks more positively about a case if the organism has been recovered and the specific reaction to antitoxin is observed.

REPORT OF CASE

S. C., born at the Presbyterian Hospital, Sept. 2, 1932, was the first child of normal, healthy parents. The birth weight was 5 pounds 14 ounces (2,666 Gm.). Delivery was normal and the breathing spontaneous. The progress of the baby was retarded by the deficiency of breast milk and by frequent stools. Protein milk with a preparation of maltose and dextrin was prescribed, and the weight at 10 days was 5 pounds 13 ounces (2,638 Gm.). Evaporated milk feedings were prescribed for home use and the breast milk feedings were dispensed with.

Summary of Reported Cases of Diphtheria of the Penis

Author and Year	Under 1 Year	1 to 16 Years	Adult	Culture	Antitoxin	Circumcised	Other Diphtheritic Foci
Munn,[2] 1897	.....	5 years	....	None	None	10 days previously	
Munn,[2] 1897	9 months	.....	....	Klebs-Loeffler bacilli +	3,000 units	Few days previously	Mother
Munn,[2] 1897	3 months	.....	....	None	1,000 units	Few days previously	Mother and brother
Post,[2] 1897	.....	.....	+	None	None	.....	Wife, child and brother-in-law
McCollom,[4] 1897	.....	4 years	....	Klebs-Loeffler bacilli +	None	.....	Nasal
McCollom,[4] 1897	.....	1½ years	....	.....	.....	Early in life	Laryngeal
O'Brien,[3] 1907	.....	13 months	....	.....	.....	3 days previously	
Beatty,[6] 1907	.....	3 years	....	.....	.....	4 weeks previously	Faucial and laryngeal
Riva-Rocci,[7] 1907	.....	1 year	....	Klebs-Loeffler bacilli +	Three injections	No	Sister
Riva-Rocci,[7] 1907	.....	4 years	....	.....	Two injections	No	
Kolmer,[8] 1912	.....	18 months	....	Klebs-Loeffler bacili +	7,200 units		
Kolmer,[8] 1912	.....	2 years	....	Klebs-Loeffler bacilli +	4,800 units		
Cochrane,[9] 1921	.....	3 years					
Bode,[10] 1921	.....	6 years	....	.....	.....	.....	Faucial
Prinzing,[11] 1928	.....	.....	28 years	Klebs-Loeffler bacilli +	.....	.....	Wife
Vasile,[12] 1928	.....	16 months	....	Klebs-Loeffler bacilli +	20,000 and 10,000 units	No	
Schmidt,[13] 1929	.....	.....	+	Klebs-Loeffler bacilli +			
Hoyne and Levy,[1] 1930	.....	7 years	....	Klebs-Loeffler bacilli +	.....	Yes	Oral and nasal
Molteni and Casazza,[14] 1931	+	Further information not obtainable					
Reported here:							
D. B.	+	.....	....	Klebs-Loeffler bacilli +	5,000 units	5 days previously	None
Rosenblum	+	.....	....	Klebs-Loeffler bacilli +	10,000 units	3 weeks previously	None
Borovsky	+	.....	....	Klebs-Loeffler bacilli +	5,000 units	10 days previously	None

The next reports appeared in 1921, Cochrane[9] reporting a case in a 3 year old and Bode[10] in a 6 year old boy. The latter patient also had faucial diphtheria.

Circumcision was performed at the hospital on the eleventh day under strictly aseptic conditions by a mohel who wore a mask and rubber gloves during the operation. Two days later he called at the home to dress the wound.

About ten days later the mother reported that the infant cried considerably and seemed to have "colic." The crying was

3. O'Brien, R.: Diphtheria of Glans Penis Following Circumcision, Brit. M. J. 2:1908 (Oct. 5) 1907.
6. Beatty, R. P.: Diphtheria of Glans Penis Following Circumcision, Brit. M. J. 2:1582 (Nov. 30) 1907.
7. Riva-Rocci, S.: Una localizzazione rara della difterite, Gazz. med. ital. 58:81 (March 24) 1907.
8. Kolmer, J. A.: Diphtheroid Bacilli of Penis, with Report of Two Cases Following Circumcision, Arch. Pediat. 29:49 (Feb.) 1912.
9. Cochrane, G.: Diphtheria of Penis with Paralytic Sequelae, Brit. J. Child. Dis. 18:86 (April-June) 1921.
10. Bode, P.: Case of Diphtheria of Glans Penis in Boy of Six, Arch. f. Kinderh. 70:112 (Oct.) 1921.
11. Prinzing, J. F.: Diphtheria of the Penis, J. A. M. A. 90:1620 (May 19) 1928.
12. Vasile, R.: Primary Diphtheria of Prepuce, Pediatria 36:595-601 (June 1) 1928.
13. Schmidt, A.: Infection of Wound of Penis and Scrotum, Deutsche Ztschr. f. Chir. 215:125-129, 1929.
14. Molteni, P., and Casazza, R.: Uncommon Example of Diphtheritic Type of Disease of Glans Penis in Infant, Boll. d. Soc. med.-chir. di Pavia. 45:309-322, 1931.

later discovered to be due to painful urination caused by the sealing of the meatus. Telephone advice was given, but the symptoms persisted and the patient was first seen at home fifteen days after the circumcision.

A necrotic, sloughing, edematous area was seen at the site of circumcision with a thin grayish film over the glans (fig. 1). Cellulitis was diagnosed at this time and hot dressings were prescribed. The infected area showed no improvement under this management, and the following day, sixteen days after the circumcision, a culture on Loeffler's medium was taken and a pure culture of diphtheria bacillus was recovered.

Five thousand units of diphtheria antitoxin was then given intramuscularly and all other treatment discontinued. Two days later the membrane began to wrinkle and loosen from its base. The following day, four days after the antitoxin administration, the membrane was removed in toto (fig. 2), and 1 per cent yellow mercuric oxide was applied.

Urination now became painless and the general condition of the infant improved. Bismuth formic iodide powder was then applied locally until complete healing resulted, October 20, thirty-seven days after the operation.

There was practically no temperature reaction produced by the infection or by the antitoxin administration. The weight, Oct. 13, was 7 pounds 6 ounces (3,345 Gm.); November 10, 9 pounds 10 ounces (4,366 Gm.). The general condition improved regularly.

Active immunization against diphtheria with three injections of toxoid at monthly intervals was instituted at 4 months of age. A Schick test, performed three months after the last injection, proved negative.

COMMENT

It is more than coincidence that in 1928 the same mohel had performed a circumcision that resulted in a case of diphtheria of the penis five days after the operation. The smears were positive for Klebs-Loeffler bacilli, and 5,000 units of diphtheria antitoxin was administered in two doses. Prompt recovery resulted.

Two other such occurrences are recalled by the Chicago health department authorities, but the records are no longer available.

This mohel had previously been discovered to be a diphtheria carrier and had been quarantined and treated a few years ago. He was released after negative nose and throat cultures had been obtained.

Fig. 2.—Appearance four days after administration of diphtheria antitoxin.

He recently performed a circumcision on a 3½ weeks old premature baby in whom a diphtheritic infection of the penis developed that resulted fatally. The case was seen three weeks after circumcision by Dr. Philip Rosenblum, who has kindly consented to my report of this case along with my own. Cultures from the penis and from the nose were positive for Klebs-Loeffler bacilli. Ten thousand units of diphtheria antitoxin was administered, but the baby died of myocarditis and bronchopneumonia.

Circumstances point to the conclusion that this man has been directly responsible for the development of at least five cases of diphtheria of the penis following circumcision. As a result, several hospitals have prohibited his operative work in their institutions.

SUMMARY

1. Only four cases of diphtheria of the penis have been reported in the literature occurring under 1 year.

2. The personally observed patient is the youngest one on record.

3. Information concerning two other authentic cases, one in the new-born period and one at 6 weeks of age, was received by personal communication.

4. Two other cases are recalled by the Chicago health department authorities.

5. In all five cases (three absolutely authentic, two reported from memory by Chicago health department authorities), circumcision was done by the same mohel.

6. Transmission of the diphtheritic infection probably took place in my case during the change of dressings at home two days after the circumcision. The mask and rubber gloves worn during the operation would probably prevent the infection at that time.

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PRIMARY ENDOMETRIOSIS OF THE URINARY BLADDER

REPORT OF ONE CASE

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During the past decade the gynecologic literature has become heavily laden with discussions of the theories as to the nature and pathogenesis of endometriosis. Owing to the rarity of vesical endometriosis, a report of this case would seem to be warranted. Thirty cases of endometriosis of the urinary bladder have been found in the literature, but of these only twenty-one belong to the so-called primary group.

The genesis of endometriosis, as well as its mode of dissemination, is still an unsettled question. Briefly summarized, the more important of the theories may be arranged as follows:

1. Origin from the normal endometrial tissue of the genital tract.
   (*a*) Proliferation in continuity through the walls of the uterus and tubes (Cullen,[1] 1896).
   (*b*) Lymphogenous metastasis (Halban,[2] 1924).
   (*c*) Propagation by retrograde menstruation (Sampson,[3] 1921).
2. Origin from embryonic remnants in the genital tract.
   (*a*) The wolffian ducts (von Recklinghausen,[4] 1895).
   (*b*) The müllerian ducts (Kossmann,[5] 1897).
3. Metaplasia of the serosal endothelium (Iwanoff,[6] 1898; Meyer,[7] 1924).

Experienced observers have adduced evidence in support of most of the theories mentioned. Most gynecologists, however, believe that the question of the pathogenesis of endometriosis is not yet settled and that the mechanism is probably not always the same.

From the Gynecological Department of the Johns Hopkins Hospital and University.

1. Cullen, T. S.: Adenomyoma Uteri Diffusum Benignum, Johns Hopkins Hosp. Rep. 6:133, 1896; Adenomyoma of the Round Ligament, Bull. Johns Hopkins Hosp. 7:112, 1896.
2. Halban, J.: Metastatic Hystero-Adenosis, Wien. klin. Wchnschr. 37:1205 (Nov. 20) 1924.
3. Sampson, J. A.: Endometriosis Following Salpingectomy, Am. J. Obst. & Gynec. 1:461 (Oct.) 1920; Postsalpingectomy Endometriosis, ibid. 2:65 (Oct.) 1921; personal communication to the author.
4. von Recklinghausen, F.: Die Adenomyome und Cystadenomyome der Uterus und Tubenwandung, Berlin, A. Hirschwald, 1896.
5. Kossmann, R.: Origin of the Glandular Inclusions in the Adenomyoma of the Uterus and the Tubes, Arch. f. Gynäk. 54:359, 1897.
6. Iwanoff, N. S.: Adenofibromyoma cysticum sarcomatodes carcinomatosum, Monatschr. f. Geburtsh. u. Gynäk. 7:295, 1898.
7. Meyer, R.: Embryonal Genesis of Adenomyomas, Zentralbl. f. Gynäk. 47:577 (April 14) 1923; Peritoneum Hyperplasia of Peritoneal Endothelium, ibid. 48:722 (April 5) 1924.

Cullen's theory of mucosal invasion has been accepted as an adequate explanation for uterine adenomyomas. The view of an origin by metastasis through the lymph spaces has few supporters. Sampson's implantation theory is probably the most widely accepted of all, especially in explanation of the origin of peritoneal and

Fig. 1.—Diagrammatic sketch of bladder tumor in relation to the uterus. Inset: Gross appearance of tumor with the characteristic bluish cysts on the surface. The bladder mucosa about the tumor is injected and thickened.

ovarian endometriosis. The serosal theory of Iwanoff, Meyer[7] and Novak[8] is supported by many. It offers the confused student of the subject an acceptable genetic explanation for many of the heterotopic endometrial nests. Though transitional stages between the peritoneal endothelium and the uterine mucosa have been observed, the segregation of endothelial cells to form an endometrial tumor has not been proved. To presuppose that the metaplastic aptitude of the peritoneal endothelium accounts for the formation of both the epithelial and the stromal elements assumes a highly specific organoid activity not present elsewhere. At present there is a tendency to explain heterotopias as due to anomalies of cell differentiation resulting from changes in cellular environment. If this is normal, the differentiation is normal; if the influences are abnormal, the differentiation is abnormal. As to the genesis of primary vesical endometriosis, I feel that von Recklinghausen's theory of wolffian duct remnants or Kossmann's of müllerian duct remnants is the most likely.

Because of its close similarity in gross appearance to malignant growths of the urinary bladder, the possibilities of vesical endometriosis must be considered in cases of hematuria, especially when associated with dysuria and increased frequency of urination, occurring in sequence.

In 1921 Starr Judd[9] reported the first case, and to date twenty-one cases of primary vesical endometriosis, including the present case, have appeared in the literature. The shallowness of the space of Retzius may account for the rarity of endometrial implants in this portion of the pelvis as compared with their relative frequency in the deep culdesac of Douglas. It is not uncommon to find endometrial implants at the base of the uterovesical peritoneal reflection following pelvic operations, though in such cases the walls of both the uterus and the bladder are usually invaded (Sampson). I feel that the term "primary vesical endometriosis" should be limited to those cases in which no demonstrable contiguity with the uterus, fallopian tubes or ovaries is present and in which there has been no surgical trauma of the bladder wall or its peritoneal reflection. In conformity with this criterion I shall present the following case, with illustrations, for no continuity could be demonstrated between the uterus and the bladder and, although there had been a previous pelvic operation, the bladder peritoneum had not been traumatized.

REPORT OF CASE

M. B., a woman, aged 27, had an appendectomy through a McBurney's incision at the age of 16 years. Bilateral salpingectomy was done for "pus tubes" without the usual suspension of the uterus by suturing the round ligaments over the tubal sites at the age of 18 years. The latter operation was performed nine days after the onset of the previous period through a midline incision. The operator noted that the tubes were easily removed, and no attempt was made to suspend the uterus. The general health was excellent until one year before admission, at which time a dull aching pain appeared in the left lower quadrant; this was not aggravated by menstruation and failed to respond to the usual forms of conservative palliation. Two months before, severe pain on micturition developed following the cessation of the menstrual period, but no hematuria was noted. However, the urinary symptoms became more marked and included dysuria and diurnal and nocturnal frequency. Catheterized specimens of urine, unfortunately collected between the periods, were negative for red blood cells. Urinary antiseptics alleviated the symptoms. On bimanual examination a small movable mass could be outlined anterior to the fundus;

Fig. 2.—Nests of endometrial tissue scattered through the bladder wall as seen in the low power field. Dilated endometrial glands lined by columnar epithelium; small nests of bladder epithelium remain on the surfaces of the cysts.

this was moderately tender and seemed pedunculated. It was thought to be a small subserous myoma of the uterus. Both ovaries were normal in size and limited in mobility. Unfortunately a cystoscopic examination was not made (1), because the possibility of a bladder tumor was not considered and (2) because the several catheterized specimens of urine had been negative on microscopic examination.

The abdomen was entered through a low midline incision; the uterus was normal in size, in good anteposition and movable, and the surfaces were smooth. The cornual scars were well healed and free of adhesions. The ovaries were normal in size

8. Novak, Emil: Significance of Uterine Mucosa in Fallopian Tubes, with Discussion of Origin of Aberrant Endometrium, Am. J. Obst. & Gynec. 12:484 (Oct.) 1926; Pelvic Endometriosis, ibid. 22:826 (Dec.) 1931; Personal communication to the author.

9. Judd, E. S.: Adenomyoma Presenting as a Tumor of the Bladder, S. Clin. North America 1:1271 (Oct.) 1921.

and were easily released from thin bands of fibrous adhesions. There was no suggestion either of peritoneal or of ovarian endometriosis. Lying anterior to the uterus (fig. 1) and completely covered by the peritoneal reflection was a small palpable mass approximately 4 cm. in diameter. The bladder peritoneal reflection was easily separated from the uterus and the mass was found to be within the bladder. The bladder was entered and the tumor mass was exposed. The bladder mucosa about it was slightly injected but otherwise normal in appearance. The mass was excised with a narrow margin of healthy bladder tissue and the wound tightly closed in three layers with plain catgut sutures. A mushroom catheter number 14 was left in the bladder for ten days. The postoperative course was smooth, and when discharged on the fifteenth day the patient voided 350 cc. of urine without hesitancy or discomfort. One month later she reported that she had had a normal menstrual period and had experienced neither abdominal nor urinary discomfort.

SYMPTOMS

In a careful review of most of the reported cases a fairly constant symptom complex presents itself, although a few have been asymptomatic from a urinary standpoint. In the majority of the cases frequency, dysuria and hematuria appear several days before menstruation, persist during the flow and generally continue for a day or even a week after its cessation. The course of the disease is chronic, starting first with a slight discomfort, which is constant but not aggravated by the menstrual periods, though later the clinical picture changes and is somewhat as follows:

Increased frequency of urination, both by day and by night, is the most common complaint and as a rule disappears completely between the periods.

Dysuria varies but usually occurs at the end of micturition, more as a sense of discomfort than as actual pain.

Hematuria, because of its microscopic nature, is rarely noted by the patient and is present only during menstruation or just preceding it.

There is a marked variation in the severity of the symptoms, depending naturally on the size and topographic location of the tumor within the bladder, as well as the degree of tissue reaction during the menstrual period. When the ureters are encroached on, there is the added symptom suggesting kidney involvement. However, even in case of ureteral obstruction the symptoms appear in a certain constant order and are sequential in appearance and degree of severity. This triad, when associated with the bimanual palpation of a tumor mass, is practically pathognomonic of vesical endometriosis. In the absence of the triad it is important to differentiate this condition from carcinoma, cavernous angiomas and bladder varicosities.

AGE

The youngest patient was 19 years of age. There is apparently, however, a predilection for the decade between 35 and 45 years. Except for the one case reported by Whitehouse,[10] all have occurred during menstrual life.

LOCATION

As a rule, the tumors are located within the floor of the bladder, just above or between the ureters, with a peculiar predilection for the right side. They are rarely found in the vertex and, though they may involve the trigon, the involvement is through extension. The size of the tumors is fairly constant, being generally between 2 and 4 cm. They usually present a distinctly nodular surface.

10. Whitehouse, H. B.: Endometrioma Invading Bladder Removed from Patient Who Had Never Menstruated, Proc. Roy. Soc. Med. 18, 1926.

TREATMENT

The treatment of this tumor cannot be prescribed dogmatically. The size, the topographic location, the age and the general condition of the patient are the deciding factors as to which of the two possible therapeutic procedures is best suited:

1. Complete excision is the method of choice in young women desirous of children and in whom the margin of bladder tissue safety is sufficient.

2. Castration is done, either by operation or by irradiation, in patients near the menopause or in whom the growth is too extensive for excision, or when the general condition of the patient contraindicates surgical measures.

SUMMARY

1. The lesion usually presents a symptom complex recognized by its cyclic relation to the menstrual period and consisting of increased frequency of urination, dysuria and hematuria.

2. The mode of treatment is dependent on the age of the patient, the size and localization of the tumor, and the general condition of the patient.

3. Since there are cases presenting an atypical picture, this tumor may easily be mistaken for malignant lesions of the urinary bladder.

Clinical Notes, Suggestions and New Instruments

POSTURAL TREATMENT OF TYMPANITES

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The presence of gas in the small bowel of infants, observed in routine roentgen examination for various conditions, has been noted for some time. Its cause and significance have not been understood. The solution of this problem was found by placing infants in the semi-inclined position.

In animals, in the all-four position, the entrance of the esophagus into the stomach is on a higher level than the exit through the pylorus. When they swallow gas with food it collects above the food and fluid secretions and can easily escape through the esophagus. Since infants lie on their backs for the most part, especially new-born infants in the hospital, the swallowed gas rises into the distal or pyloric end of the stomach, where it is trapped by fluids. It therefore cannot escape through the esophagus and must be forced through the pylorus into the small intestine.

To prove this assumption, fifty new-born infants were roentgenographed in this manner:

The first day they were taken from the cribs where they had been in the usual recumbent posture and roentgenographed. The second day they were roentgenographed after having been kept in the semi-inclined position for twenty-four hours. The semi-inclined position should cause the gas bubble to rise into the cardiac portion of the stomach so that it might escape through the esophagus freely. Of the fifty cases examined, twenty-five showed the presence of gas in the large and small intestines on the first day of the examination. These twenty-five cases showed disappearance of the gas in the small intestine by the postural treatment in twenty-two cases. The three failures were probably due to the fact that it was difficult to maintain the inclined position in all cases.

Routine examination for a variety of conditions such as occur in a hospital rarely showed the presence of gas in the small intestine in children over 3 months of age. This is probably due to the fact that children roll from side to side at about this age. Since it is well known that infant colic frequently

From the first Obstetric Division of the Bronx Hospital and from the Harlem Hospital.
Material on exhibition at the Gastro-Intestinal Fortnightly Symposium at the New York Academy of Medicine in October 1934.

disappears after this age, the possibility suggested itself that the gas forced into the small bowel was an important factor, if not the sole cause, in most cases of infant colic. In a number of cases in which infants were doing well and gaining weight, it was found that colic disappeared by keeping them in the inclined position or on the abdomen. The latter procedure is an old method used by grandmothers for centuries. Its rationale is now explained.

The gas distention that occurs postoperatively and in pneumonia may be dependent on the same factors as described. In fact, it is suggested that Fowler's position is probably beneficial mainly because of the same conditions.

CONCLUSIONS

1. Fifty per cent of new-born infants showed distention of the small bowel with gas.
2. Past 3 months of age, the gas disappears from the small bowel in healthy infants.
3. The gas may be made to disappear from the small intestine by placing the infant in the semi-inclined position so that gas in the stomach may not be trapped at the pylorus and then forced into the small intestine.
4. Gas distention in pneumonia and in postoperative cases may possibly be explained in the same way.

A TREPHINE MODIFIED TO SECURE BONE MARROW (STERNAL) BIOPSIES

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The trephine here devised and illustrated as to its parts (fig. 1) is modified from the various puncture needles (Ghedini, Arinkin, Seyfarth and others), long suggested to get marrow specimens safely both for histologic embedding and for smears for routine staining. The sternum is ideally adapted as a source, both because of ease of access and because of its persistent functional activity throughout life. The ribs are equally active but not so simple to approach. Isaacs has correctly criticized simple needle puncture methods as really yielding mixtures of marrow elements "washed out" with traumatically induced blood flow. Thus one has blood with certain marrow admixtures. We have found this true, especially when the marrow system is inactive. Ordinary chronic myeloid leukemia, however, yields needle puncture material so readily that smears so closely resemble ordinary blood smears as to make the observer feel that he has tapped an actual vessel or blood space.

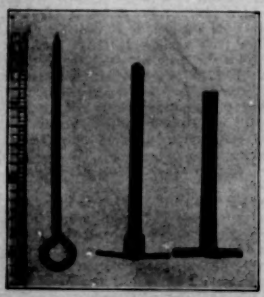

Fig. 1.—Parts of the instrument.

It is obvious that sections of fixed marrow tissue, while useful, can never give the desired morphologic detail essential to develop the diagnostic and therapeutic guidance that this preeminent hematopoietic source material (erythrocytic, granulocytic and thrombocytic) promises.

This instrument is easy to use. The biopsy is painlessly accomplished under simple procaine hydrochloride anesthesia, and a 0.5 cm. scalpel incision through the skin brings the instrument down to the periosteum. It yields a round marrow segment without either hemorrhage or blood admixture. The tip of this plug permits the making of from three to five delicate touch smears. Stained either with double strength Giemsa or ordinary Wright's stain, beautiful diagnostic preparations are available. The present superactivity in the domain of hematology renders studies of bone marrow in all cases of low leukocyte or platelet counts, with or without purpuric or ulcerative tendencies, as well as all anemias of doubtful origin or classification, a fruitful field for investigation.

From the Duluth Clinic.

STRUCTURE OF THE INSTRUMENT

This instrument consists of three parts: The first part is a trephine. This is made of chrome vanadium steel. It measures 5.5 cm. in length and has an inside diameter of 4 mm. and an outside diameter of 5 mm. Thus it is readily seen that the metal is very thin. On the terminal end of the trephine is a series of fine teeth. The proximal end is fitted with a handle-like effect in which the instrument can be grasped and readily turned. On one side of the instrument, beginning at the terminal portion, there is a millimeter scale, which runs up to 3 cm. The proximal lumen will just fit a Luer syringe. The second portion of the instrument consists of a stilet that just fits the inside lumen of the trephine. The terminal end of the stilet has a blunt, faceted (three facets) surface. The third portion consists of a long, screwlike slender nail. Only the terminal end for a distance of about 3 mm. has this screwlike effect.

Fig. 2.—Biopsy specimen magnified four diameters.

TECHNIC

The field of operation is prepared in the usual manner, with the use of iodine and alcohol; a site over the sternum is selected in the interspace between the second and third ribs.

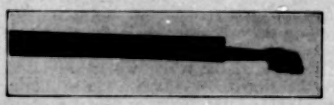

Fig. 3.—Roentgen appearance of the biopsy specimen.

A small fine hypodermic needle being used, first the skin and subcutaneous tissue and then the periosteum are infiltrated well with procaine hydrochloride solution. It is then best to wait for from five or ten minutes; an incision is then made over this site about 1 cm. in length. Dissection is carried down to the sternum in an effort to divide the subcutaneous tissue and the tendinous insertions on the anterior aspect of the sternum. The trephine with the stilet inserted is then introduced through the incision and with a boring motion is carried down to the periosteum. The stilet is then withdrawn and the screw is inserted through the trephine and bored into the anterior plate of the sternum until it holds firmly. The trephine is turned slowly and pressure is applied. The trephine will be not only felt but actually heard as it cuts through the anterior plate of the sternum. When the trephine is through the lamella of bone there is a certain give, and a few more turns are taken and the instrument (the trephine and the screw) are withdrawn together. It will be found that the plug of the sternum and the bone marrow will be attached to the screw. The screw is removed, the specimen is gently stroked two or three times over one or two glass slides and the specimen is then placed in 5 per cent formaldehyde solution. Sections for microscopic study may be prepared if desired.

There is very little bleeding, and the wound edges usually fall together or, if not, they can be brought together with adhesive plaster, or a skin clip and a dressing may be applied. As a rule, there is very little distress during or after this procedure.

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Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

THE TESTIS HORMONE

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NOTE.—This article and the articles in the previous issues of THE JOURNAL *are part of a series published under the auspices of the Council on Pharmacy and Chemistry. Other articles will appear in succeeding issues. When completed, the series will be published in book form.*—ED.

The testicle exercises at least two biologic functions of utility in the organism, the primary of which is maturation of germ cells and the secondary the secretion of one or more substances known as the testis hormone. The primary function is much the older and is exercised not only in vertebrates but in invertebrates as well. Hormone secretion, however, appears to be restricted to the vertebrates and to have undergone a gradual increase in complexity; it is on the accessory organs of reproduction that the influence of the testicular hormone is exercised.

In some lower fish the sex cells are merely liberated from the gonad into the general body cavity, making their escape through abdominal pores to the outside to meet the female cell; no specialized duct is maintained for their passage. The majority of fish and amphibia utilize the wolffian duct for carrying spermatozoa away from the testicle; the functional condition of the duct is developed periodically as the germ cells mature in the testes. In still higher forms this wolffian duct, or vas deferens, becomes more complicated; it may be coiled into an epididymis-like structure and produce evaginated pocket-like glandular organs (seminal vesicles) which contribute secretions. Additions include also the establishment and maintenance of various types of intromittent organs for the transfer of semen to the female genital passages for internal insemination. In mammals many structures such as the prostate gland, seminal vesicle, Cowper's gland and others and the intromittent, or copulatory, organ make of this system a rather complicated, correlated set of structures whose functional state must be established at the proper time for storing, maturing and transporting germ cells. In general the testes of vertebrates appear to function for only a limited period once each year when the germ cells are matured and hormone secretion induces a functional condition on the part of all accessory reproductive structures; hormone secretion is therefore closely correlated with the primary testicular function of germ cell production.

Some few vertebrates, including man, do not have a strictly limited annual reproductive period; in these, germinal cells are matured during all seasons of the year. In this group hormone secretion is likewise continuous, and the accessory organs are maintained in a functional condition at all times.

It is my aim in this section to present some of the general phases and particular details of the testis hormone and to discuss some of the principles and possibilities of its clinical application. The experimental animal must be depended on for presenting the various aspects, since knowledge of the manifestations of hormone deficiencies in man, of methods of detecting the presence or absence of the hormone, or of its utility in the species is so limited as to be of little value.

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METHODS OF DETECTION

The tardiness with which the hormone of the testicle was successfully extracted has been due first to the lack of proper methods of revealing it, and, secondly, to the relatively low yield of the hormone from extraction of this organ. The most frequently used test is the growth of the comb of the castrated cock, or capon. The work of many individuals has revealed that castration of the cock entails the immediate regression of the comb and that a testis graft or the injection of extractives from cryptorchid testicles of pigs rebuilds the comb of capons to the cock type.[1]

(*a*) The capon comb growth test, applied most often to the single comb leghorn fowl, depends on the growth response of the comb of a capon following subcutaneous injections. It has been utilized in many laboratories[2] with slightly different procedures; as employed by Gallagher and Koch, the response is determined by the increase in length plus height of the comb measured in millimeters. The bird unit of hormone has been defined by them as the amount of material injected over a period of five days (daily injection) required to cause an increase in the comb (length plus height) of from 3 to 7 mm., by the sixth day, in at least five out of ten injected capons.[3]

Mammalian tests thus far employed have depended on the responses of different parts of the accessory reproductive organ complex. External manifestations have proved to be impracticable, though attempts have been made to utilize such factors as body size, conditions of the hair coat, and fat deposition.

(*b*) The spermatozoon motility test, one of the first mammalian tests to be employed for detection of the testicular hormone, depends on the fact that spermatozoa in the epididymis of a guinea-pig, after its surgical isolation from the testis, show a longer persistence of viability (or capacity to show movement on proper stimulation) when hormone is present. With a normal supply of hormone, persistence of viability is from sixty-five to seventy days, whereas it is approximately twenty-three days in the absence of hormone;[4] Kahak in Moscow claims for his guinea-pigs that this is forty days without hormone. Viability is determined by hashing the isolated epididymis in physiologic solution of sodium chloride and observation of spermatozoon movements under the microscope.

Injections of active preparations of testis hormone have maintained the life of epididymal spermatozoa for periods approximately equivalent to those when hormone is secreted by an intact testis.[5] It is presumed

1. Pezard, A.: Bull. biol. franç et belge. **53**:1, 1918. Benoit, J.: Arch. de zool. exper. et gén. **60**:217, 1929.

2. Dodds, E. C.; Greenwood, A. W., and Gallimore, F. J.: Lancet **1**:683 (March 29) 1930. Dodds, E. C.; Greenwood, A. W.; Allen, H., and Gallimore, F. J.: Biochemical J. **24**:1031, 1930. Freud, J.: de Jongh, S. E.; Laqueur, E., and Minch, A. P. W.: Klin. Wchnschr. **9**:772 (April 26), 1871 (Oct. 4) 1930. de Fremery, P.; Freud, J., and Laqueur, E.: Arch. f. d. ges. Physiol. **226**:740 (July 16) 1930. Proc. Soc. Exper. Biol. & Med. **28**:325 (Jan.) 1929. Funk, C.; Harrow, B., and Lejwa: ibid. **26**:569 (April) 1929; Am. J. Physiol. **90**:468 (March) 1930. Funk, C., and Harrow, B.: Biochem. J. **24**:1672, 1930. McCullagh, D. R., and his associates: Tr. Roy. Soc. Canada **26**:183, 1932. McCullagh, E. P.; McCullagh, D. R., and Hicken, N. F.: Endocrinology **17**:49 (Jan.-Feb.) 1933.

3. (*a*) Gallagher, T. F., and Koch, F. C.: J. Pharmacol. & Exper. Therap. **40**:327 (Nov.) 1930; (*b*) Proc. Second Internat. Cong. Sex Research, London, 1931, p. 312. (*c*) Koch, F. C.: Allen's Sex and Internal Secretions, Baltimore, Williams and Wilkins Company, 1932, p. 272.

4. Moore, C. R.: J. Exper. Zool. **50**:435 (April 5) 1928. Benoit, J.: Bull. d'hist. appl. **8**:178, 1931.

5. Moore, C. R., and McCoy, R. C.: Am. J. Physiol. **87**:436 (Dec.) 1928. Kahak, J. R.: Trans. on the Dynamics of Development **2**:62, 1934. (Russian with English summary.)

that the action is a hormonic stimulation of epididymal cells to secrete some substance necessary for preservation of spermatozoa in a healthy state.

(*c*) The electrical ejaculation test, specifically applied thus far to the guinea-pig, depends on inducing a seminal discharge on stimulation by 30 volts of alternating electric current applied to the head. The ejaculated semen, consisting of spermatozoa and secretions from the epididymis, prostate, seminal vesicle and Cowper's and probably other glands, becomes coagulated in a rubbery mass within a period of from two to three minutes after discharge. This reaction, described originally by Batelli,[6] has been employed as a test for the hormone by Moore and Gallagher[7] and by Kabak.[8] Guinea-pigs castrated for a period of two months or more give either no ejaculate or only a clear watery noncoagulable discharge. Subcutaneous injection restores secretory activity in the seminal vesicle and prostate, and it is the interaction between secretions of these two structures that produces the coagulated mass normally constituting the vaginal copulation plug.

(*d*) The rat prostate cytology test, developed and applied by Moore, Price and Gallagher,[9] depends on the fact that castration induces cytologic changes in the secretory cells of the prostate within a period of four days; longer periods after castration result in more pronounced involutionary changes, a maximum degeneration occurring in about twenty days. Injections of testis hormone begun immediately after castration prevent the appearance of castration changes or, if begun after their development, restore the normal secretory state of these cells.

(*e*) The rat seminal vesicle cytology test, developed and applied by Moore, Hughes and Gallagher,[10] depends on cytologic changes in the secretory cells of this organ. The large cytoplasmic granules are lost within two days after castration, and within ten days the cells have regressed to approximately one-third their former height. Injections of testis hormone prevent castration changes from developing or restore the original condition.

Seminal vesicles of the mouse similarly respond rapidly to hormone loss and to injected hormone.[11] Changes in the acidity of seminal vesicle secretions have been found to occur after castration and that fact has been proposed as a test for the hormone.[12]

(*f*) Cowper's gland test in the rat may also serve as a hormone indicator. Heller[13] has described the degenerative changes and the reactions of this gland to injected hormone.

(*g*) The vas deferens test is also adequate for indicating the presence of hormone. The reactions of this organ to castration and to hormone injections in the rat have been described by Vatna.[14]

All biologic tests are, of course, subject to the factor of animal variability, but the capon comb growth test and the rat prostate and seminal vesicle cytology tests have proved fairly satisfactory as quantitative tests;[15] the capon test has been by far the most frequently used, and its application has been more nearly perfected. A complete substitution for the testis in the rat requires a daily injection of approximately two to three bird units of testis hormone to maintain the prostate and approximately four to five bird units for the seminal vesicles (Hansen).

SOURCES, METHODS OF EXTRACTION AND NATURE OF THE HORMONE

Pezard[1] was one of the earliest to obtain promising results from extraction of testes; saline extracts of cryptorchid testicles of swine injected into capons restored the comb almost to the proportions found in the cock. The testicles of the pig, ram, goat and bull have served as sources of hormone, as have also the urines of men and women, and the blood of the bull and the goat; comb-growth stimulating substances are also reported[16] from male blossoms of a plant (Salex caprea).

The first successful extraction of the testis hormone was done by McGee,[17] working in Koch's laboratory, from the lipoid extractives of fresh bull testes. The method with its refinements and extensions by Gallagher and Koch is essentially as follows:

Fresh or frozen testicles from the bull, ground to a pulp, are extracted with four volumes of 95 per cent alcohol at room temperature. The active material is taken up from the concentrated alcoholic extract in benzene, which, when evaporated in vacuo, leaves a residue that is taken up in acetone and permitted to stand for some hours at —10 C. Evaporation of the acetone and suspension of the solids in olive oil gives a potent preparation suitable for animal injection. Further reduction of solids is effected by dissolving the acetone evaporated material in 70 per cent alcohol and agitation with hexane, by which procedure much inert material is removed. Evaporation of the alcoholic solution yields a heavy oily residue, which is dissolved in ether and shaken with aqueous 10 per cent sodium hydroxide; the majority of the activity remains in the ether layer. By repeating some of the treatments with 70 per cent alcohol, Gallagher and Koch have obtained a product of such potency that the bird unit represents a total weight of solids of approximately 0.01 mg.

Extractions of human urine have yielded a product possessing biologic effects similar to those of testis extractives (Loewe and Voss; Funk, Harrow and Lejwa; Dodds, Greenwood and Gallimore; Butenandt). Procedures of urine extraction have varied in the hands of different workers, but that described by Gallagher and Koch[18] has yielded a product of relatively high purity. The urine is acidified with sulphuric acid to approximately 1 per cent by volume, filtered, and extracted with benzene in a continuous extractor. Benzene distillation yields a residue that is taken up in ethyl ether and extracted with 10 per cent aqueous sodium hydroxide; this treatment removes approximately 90 per cent of the solids; the ether layer containing the active substance is evaporated to dryness and is suitable for injections when dissolved in olive

6. Batelli, F.: Compte rend. Soc. physique et d'hist. nat. de Genève **20**:71, 1922.
7. Moore, C. R., and Gallagher, T. F.: Am. J. Anat. **45**:39 (Jan.) 1930.
8. Kabak, J. M.: Endokrinologie **9**:250 (Oct.) 1931; **10**:12 (Jan.) 1932.
9. Moore, C. R.; Price, Dorothy, and Gallagher, T. F.: J. Anat. **65**:71 (Jan.) 1930.
10. Moore, C. R.; Hughes, W., and Gallagher, T. F.: Am. J. Anat. **60**:109 (Jan.) 1936.
11. Loewe, S., and Voss, H. E.: Abhd. d. Wissensch. in Wien, Abhd. Anat. No. 20, 1929. Martins, Thales: Endokrinologie **7**:150 (Aug.) 1931. Martins, Thales, and Rocha e Silva, A.: Mem. do Inst. Oswaldo Cruz (suppl.), 1930, p. 195.
12. von Lanz, T.: Anat. Anz. **73**:108, 1931.
13. Heller, E. E.: Am. J. Anat. **50**:73 (March) 1932.
14. Vatna, S.: Biol. Bull. **58**:322 (June) 1930.
15. Gallagher and Koch.[18] Hansen, I. B.: Endocrinology **17**:163 (March-April) 1933.
16. Loewy, S.; Voss, H. E.; Lange, F., and Spahr, E.: Endokrinologie **2**:29 (Jan.) 1928.
17. McGee, L. C.: Proc. Inst. Med. **9**:242, 1927.
18. Gallagher, T. F., and Koch, F. C.: Endocrinology **18**:107 (Jan.-Feb.) 1934.

oil. Further refinement was carried on by fractional distillation under high vacuum; distillation at a temperature of up to 150 C. removes approximately 50 per cent of the remaining solids. Further purification by the use of ethanol, methanol and carbon tetrachloride as solvents, and additional fractional distillation, produced a product of which a bird unit contained about 0.1 mg. of solids.

Crystalline material having a high activity has been obtained from urine extracts.[19] This involved, in the case of Butenandt, hydrolysis and fractionation with organic solvents of an active crude oil extracted from human urine. Crystals were obtained by treatment with hydroxylamine of an aqueous-alcohol soluble fraction. Butenandt estimates that approximately two million gallons of urine would contain something of the order of 1 Gm. of the crystalline material. Analysis of the crystalline material indicates a close similarity of the substance to theelin (keto-hydroxyestrin). The activity of the crystalline material was approximately one bird unit to each 0.001 mg., but the bird unit employed differs from that used by Gallagher and Koch. It is a ketone-alcohol derivative with the suggested formula of $C_{19}H_{28}O_2$; its structural formula has been suggested (1932).

CONDITIONS GOVERNING SECRETION

It is unknown how early in life the testis begins to secrete its hormone. Though the definite association of the embryonic development of the wolffian duct with a testis is well known, it is not yet clear to what extent such early development is conditioned by the testis itself, or whether the hormone (if such exists in embryonic life) is the same as that produced by the mature testicle. It is noteworthy that active substances can be extracted from the testis of the embryonic calf [20] but have not been found in the urine of young postnatal calves or in that of boys under the age of 10 years. In the rat from thirty-five to forty days after birth, secretory differentiation of the seminal vesicle has occurred, and some secretion appears in the lumen.

The testicles are capable of secreting hormone much earlier than they normally do; injections of gonadotropic substances (pregnancy urine or extracts, placental extracts, pituitary tissue or extracts, pregnant mare serum) may induce development of the secretory state of the accessory reproductive organs much earlier than is normal. Precocious puberty in boys, though pathologic, demonstrates that testes can function earlier than usual. Puberty involves elements other than mere secretion of testis hormone, for conditions must be developed that stimulate this organ to its secretory activity. The pituitary and probably other glands assume activities previously latent, and a general maturing of the entire organism is undoubtedly involved in this important phase of life.

Subsequent to the normal attainment of its hormone secreting activity the testicle in different species exhibits two extremes of hormone secretion, with intermediate types (1) continuous secretion throughout reproductive life and (2) secretion at intermittent periods lasting only a few weeks during each year; such groups can be designated as constant breeders and seasonal breeders. To the first group belong man, some other primates, rabbit, guinea-pig and rat, and to the second group belong the large majority of all vertebrates including the majority of mammals.

Constant Breeders.—The conditions under which testis hormone is secreted is much better known for the rat than for man, but presumably a parallel exists. In the rat, testis hormone is secreted continuously after its start has been made, as can be determined by microscopic examination of the prostate and seminal vesicles; castration induces changes in these organs within two or three days. Hormone storage in the body therefore does not exist to an appreciable extent, and a continuous secretion is required for the existence of a functional group of accessory reproductive organs. Continuous hormone secretion exists in the guinea-pig also, as shown by similar amounts of ejaculate obtained each week during an entire year.[7] In man, twenty-four hour samples of urine show an excretion of the hormone, but I am unaware of daily analyses for a sufficient period to determine the degree of fluctuation in renal output.

Secretion of hormone varies in rate among different individuals of the same species if the gross size of accessory reproductive organs can be taken as a criterion. This means presumably that existing concentration of hormone within the body varies, but it is not clear whether this means a greater secretion or lowered elimination of the substance through the kidneys; nothing is known regarding the variability of the renal threshold of excretion.

The testes are not self regulating organs that control their own periods or rate of function. It has been abundantly demonstrated by Smith and Engle,[21] Zondek and Aschheim [22] and many later workers that the anterior lobe of the pituitary gland regulates the activity of the sex glands. Removal of the pituitary is followed by cessation of germ cell production and hormone secretion. Introduction of fresh pituitary material into hypophysectomized males restores testicular function. Hormone secretion is thus controlled from without and not by the regulative activity within the testis.

Hormone secretion by the testicle is modified by nutritional conditions. Maintenance of rats on a diet deficient in vitamin B reduces, or abolishes, hormone secretion. Restriction of the diet to inanition levels, but with excessive B-requirements, produces similar effects.[23] In each case it is believed that the anterior pituitary is the real center of injury, since (*a*) the testicles of such vitamin B-free or inanition animals respond immediately to injections of hypophyseal extracts and secrete large amounts of hormone and (*b*) the hypophyses of vitamin B-free [24] and inanition animals [25] have a lowered capacity to stimulate the gonads of immature animals.

Undescended testes of mammals, though failing to produce germ cells because of the lack of scrotal function,[26] continue to secrete hormone in apparently undiminished amounts. This is apparent from observations on naturally occurring undescended testes of man and other mammals as well as in experimentally produced cryptorchid conditions. Thus, a guinea-pig having one testicle removed and the second one confined in the abdomen a few days after birth will continue to produce

19. Butenandt, A.: Ztschr. Angew. Chem., 44:905, 1931, 45:655, 1932. Fraenkel, K., and Mainz, H.: Arch. Int. Medicam. Int., 51:630, 1933. (Chem. Abst., 26:1453, 1932.)
20. Wemmer, E. B., and Koch, F. C.: Proc. 2d Internat. Congr. Sex Res. (London), 1931, p. 329; Endocrinology, 16:267 (May-June) 1932.
21. Smith, P. E., and Engle, E. T.: Am. J. Anat., 40:159 (Nov.) 1927. Smith, P. E.: Ibid., 45:205 (March) 1930.
22. Zondek, Bernhard, and Aschheim, Selmar: Klin. Wchnschr., 6:248 (Feb. 5) 1927; Arch. f. Gynäk., 130:1, 1927.
23. Moore, C. R., and Samuels, L. T.: Am. J. Physiol., 99:278 (Feb.) 1932.
24. Evans, H. M., and Simpson, Miriam E.: Anat. Rec., 45:216, 1930.
25. Evans, H. E., and Wolfe, J. M.: Anat. Rec., 45:232, 1930.
26. Moore, C. R.: Am. J. Anat., 34:369 (Nov.) 1924.

coagulable ejaculates for periods longer than a year; this occurs when the remaining testicular mass represents approximately 2 per cent of the normal. There is insufficient evidence to permit one to state whether the quantity of hormone secreted is greater or less than would occur with two normal testicles, or whether cryptorchid testes cease to produce hormone earlier than do normal testes.

Ligation of the vas deferens has been practiced on man with the presumption that closure of the outlet passages from the testis induces degeneration of the germinal epithelium and hypertrophy of the interstitial cells and thus greater secretion of hormone, which is supposed to have a rejuvenating effect. The facts are that closure of the outlet passages does not of itself lead to germinal epithelium destruction, that it is questionable whether hypertrophy of interstitial cells occurs, that there is no available evidence that more hormone is secreted or that testis hormone has a rejuvenating effect on the organism.

Seasonal Breeders.—Sharply contrasted with continuous hormone secretion is the condition in which breeding and hormone secretion is restricted to a single short yearly period. This condition is characteristic of practically all vertebrates below mammals (excepting a few forms such as the fowl) and also of the greater number of mammals.

Conditions existing in the ground-squirrel (Citellus tridecemlineatus) have been subjected to a rather thorough study, and the yearly events in this form may be used to represent the annual mammalian cycle.[27] Citellus breeds in April or May when accessory organs are at the height of their secretory function. By June (in the Chicago area) hormone secretion has diminished, as shown by beginning involution of the reproductive system. The animal goes into hibernation about October or November, and testis hormone secretion is practically negligible until February. It emerges from hibernation usually in April. Thus, despite the continuous presence of testes, it secretes hormone during four months and at a submaximal rate during part of this period.

An experimental study of this interesting condition in the ground-squirrel reveals that the accessory reproductive organs respond at once to injected testis hormone; hence the involution of these organs is due to a diminished testicular secretion and not to refractiveness to hormone. Furthermore, administration of substances that stimulate testicular activity (fresh pituitary tissue, extracts of dried pituitary, or extracts of pregnancy urine) cause a sudden increase in size and functional activity of all accessory reproductive organs equal to that found at the height of the breeding period; this can be accomplished at any period of the year. It is apparent, therefore, that testes may be present but may not secrete hormone and that they can be stimulated to sudden activity by gonadotropic substances. Wells has determined that hypophyses taken from these males at the approach of, or during, reproductive activity contain a high potency for stimulating the gonads when implanted into immature female rats but that hypophyses removed during the period of sexual quiescence fail to exhibit this power. It is suggested, therefore, that seasonal periodicity in hormone secretion is controlled basically by the anterior pituitary.

27. Moore, C. R.; Simmons, G. F.; Wells, L. J.; Zalesky, M., and Nelson, W. O.: Anat. Rec., to be published. Wells, L. J.: Unpublished data.

CONTROL OF HORMONE SECRETION

The testicles are capable of secreting large amounts of hormone before the stage of puberty, but they do not; in adult life they secrete only a certain amount of hormone, though capable of much greater secretion; only 2 per cent of the normal fresh weight of testis tissue may secrete as much as two normal testes; two testes may be present for months and not secrete a detectable amount of hormone; all these facts present an interesting functional puzzle that invites speculation as to the controlling forces active in regulating sex gland function.

A suggested mechanism of reciprocal interactions between the gonads and pituitary has been developed on the basis of experimental work in this and other laboratories to account for conditions that exist in constant breeders as well as in seasonal breeders. Other papers present the ideas more fully and the evidence suggesting such an explanation.[28]

It is well established that anterior pituitary secretions stimulate the gonads to function and that the presence of these secretions is necessary for maintenance of the function; variability in production or release of pituitary secretions induces variabilities in gonad function. It has also been abundantly demonstrated that the gonad hormone of either testis or ovary so influences the pituitary as to make lesser amounts of pituitary secretions available to the organism for inciting gonad activity.[29] In the case of constant breeding males, therefore, the pituitary appears to exercise a continuous secretion of the substances that stimulate gonad activity, though always far below its maximal capacity to secrete them; the inhibiting action of gonad hormones on the pituitary apparently affords a check on the production of its secretions, this check being released when the gonads are removed. Many workers since Engle,[30] and Evans and Simpson [31] have confirmed the observations that the pituitary from castrate animals of either sex is a more potent sex gland stimulator than that from normal animals of the same sex. That the normal testicle is capable of secreting greater amounts of hormone than it normally does is indicated by its response to the administration of gonadotropic substances. The effect of gonad hormone inhibition of the pituitary and the resultant failure of testis function is well illustrated by injecting estrogenic substance into normal males; both germ cell production and hormone secretion fail.[32] The pituitary is rendered less potent by administration of gonad hormone; this is demonstrated by implanting pituitaries from animals that have received large doses of the hormone.[33]

In the strictly seasonal breeding types it is indicated that the pituitary does not secrete continuously and that in some manner certain environmental agencies play an important part in its activity. Manipulation of environmental agencies such as duration of daylight or changes of temperature have been revealed to have a pronounced effect on reproductive phenomena. Thus, Rowan [33] in

28. Moore, C. R., and Price, Dorothy: Am. J. Anat. 50:13, (March) 1932. Moore, C. R.: Am. J. Obst. & Gynec., to be published.

29. Moore, C. R.; Leonard, S. L.; Hisaw, F. L., and Morris, S. J.: Proc. Soc. Exper. Biol. & Med. 27:762 (April) 1930; Endocrinology 14:451 (Nov.-Dec.) 1930. Smelser, G.: Arch. f. exper. Path. u. Pharmakol. 160:183, 1931. Leonard, S. L.: Anat. Rec. 51:45 (Aug. 25) 1932.

30. Engle, E. T.: Am. J. Physiol. 90:101 (Feb.) 1929.

31. Evans, H. M., and Simpson, Miriam E.: Am. J. Physiol. 90:371 (July) 1929.

32. Smelser, G., and Kun, S.: Biol. Gen. 9:815, 1933. Moore and Price.[28]

33. Rowan, William: Nature 115:494, 1925; Proc. Boston Soc. Nat. Hist. 39:115, 1929.

Alberta increased the length of the daylight period by a few minutes each day with electric lights and caused the testes of a small bird (Junco hymenalis) to increase hundreds of times in weight and to mature spermatozoa during outside winter temperatures of 40 below zero C. or F.; progressive shortening of the daylight period led to progressive testis involution. Bissonnette [34] has confirmed this and by a similar technic induced a mammal (ferret) to mate at entirely unusual periods. Craig-Bennett [35] could control the reproductive state of fish to a remarkable degree by mere changes of temperature and could induce the breeding state at practically any period of the year.

It is thus strongly suggested that the controlling influence which regulates hormone secretion is a reciprocal interaction between the gonad and the pituitary gland. The oscillations between these, granted other conditions are normal, appear to regulate the intensity of action of each gland by the mutual interplay of their secretions, but in some animals an extraneous factor from the environment participates in the control of activity. Evidence has been obtained on the ferret that the effect of light is induced through the hypophysis. The environmental factor operating on the ground squirrel does not appear to be light.[37]

ONE TESTIS HORMONE OR MORE?

The question whether the testis produces more than one hormone is not settled at the present time. If more than one substance is produced, the facts available indicate a similarity so close that all are extracted by the same means and react alike to steps in purification. The same preparation of hormone extracted and purified by methods employed in Koch's laboratory will (*a*) induce the growth of the capon comb, (*b*) prevent or repair all known castration changes in the accessory reproductive organs of the rat, (*c*) restimulate castrated guinea-pigs to produce typical coagulable ejaculates, (*d*) maintain the life of epididymal spermatozoa in the guinea-pig, (*e*) prevent the development of castration cells in the pituitary and (*f*) restore the accessory reproductive organs in the ground-squirrel.

The chief evidence thus far presented for the secretion of at least a second hormone, believed to be derived from the activity of the germinal epithelium, comes from the work of Martins and Rocha,[36] in which it is claimed that: 1. Rats made cryptorchid experimentally maintain a normal set of accessory reproductive organs but show castration cells in the pituitary. 2. Hypophyses from experimental cryptorchid rats are more potent as gonadotropic agents than are those from normal animals. 3. Experimentally produced cryptorchid rats when joined in parabiosis with normal females induce a continuous estrous cycle in the normal female partner; normal parabiotic male partners do not have this effect. 4. Castrated rats implanted with fresh testis tissue, or injected saline extracts of these, do not develop castration cells in the anterior pituitary but show an atrophied set of accessory reproductive organs.

In my estimation, further work is needed to establish as a fact that more than one hormone is secreted by the testicle. A sufficiently careful study should be made of the conditions under which the pituitary cells become castration cells. Furthermore, the effects of quantitative variations in both sex hormones and pituitary hormones must be subjected to rigorous examination. Until this phase of the problem receives more light, it is advisable to withhold judgment on the unity or duality of the testis hormone.

CLINICAL SIGNIFICANCE OF TESTIS HORMONE

The question of clinical application of testis hormone is a large one. Important considerations in regard to its application at present are, first, the availability of the product; second, the dosage, and, third, its usefulness as a drug.

The principal available sources of the hormone at present are testicles of large mammals and human urine. In the course of studies on extraction, purification and chemistry of the hormone carried on in Koch's laboratory, several tons of bull testes have been utilized and hundreds of gallons of human urine have been extracted, yet one difficulty in advancement of knowledge of the hormone lies in obtaining sufficient quantities for experimental work.

Nothing is known regarding the usual needs of a normal man or the quantity necessary for daily injection into a castrated man to constitute a replacement dose. In a mature rat the daily dose sufficient to maintain the prostate gland and seminal vesicle in an approximately normal secretory state represents the material extracted from approximately 300 Gm. of fresh bull testes or the extract from 500 cc. of human urine. The quantity that would be required as a replacement dose in man may only be conjectured, since neither the relative sensitivity to the hormone nor the threshold of response of man is known. The amount excreted in twenty-four hour samples of urine has been determined for individuals, but the relation between the amount produced, or used effectively, and that excreted in the urine is undetermined.

From animal experimentation two points have been determined: 1. Hormone storage in the body does not exist and daily administration by injection must be given to maintain a normal secretory state of the accessory reproductive organs. The absence of a single day's injection of estrogenic substance is registered as a colored bar on regenerating feathers of a brown leghorn fowl.[37] 2. Some structures respond to a lower threshold of hormone than others; hence complete replacement requires the maintenance of a sufficiently high concentration to affect only those structures that respond to the higher concentrations. The prostate gland of the rat, for example, is maintained in a structurally normal state by from one-third to one-half the amount of hormone required by the seminal vesicles.

The therapeutic value of the hormone cannot be stated at present. This question is pertinent: What is the function of this hormone in man? The logical approach to the answer is obviously the study of the castrated individual and biologically knowledge of the effect in man is very fragmentary. This is understandable, perhaps, when one considers the popular conceptions under which both the layman and the clinician have grown up. What man has not been subjected to the popularly accepted opinion that loss of virility was indeed almost equivalent to death? Admitting that the physiologic effects of castration are extremely important, the real problem for consideration is the biologic aspect. Psy-

34. Bissonnette, T. H.: J. Exper. Zool. 50:301, 1931; Proc. Roy. Soc., London, s. B 110:322, 1932.
35. Craig-Bennett, A.: Phil. Tr. Roy. Soc. B 219:197, 1930.
36. Martins, T., and Rocha e Silva, A.: Endocrinology 15:421 (Sept.-Oct.) 1931.
37. John, Mary, and Gustavson, R. G.: J. Exper. Zool. 58:31 (Feb. 1) 1930. John, Mary; Poulsen, C. H., and Gustavson, R. G.: J. Exper. Zool. 60:69, 1931.

chologic states may as well be treated with substances more easily obtained than testis hormone.

Prepuberal castration differs from postpuberal in both man and other animals. In man at puberty the indexes of maturity such as characteristic hair growth and distribution, attained growth of the genitalia, the deepened voice and physical stature have been established. They are not markedly changed, if at all, by postpuberal loss of hormone, but loss of the testes prior to puberty may cause modifications in these characteristics; modification of growth is not so clearly established. Eunuchs are said to be approximately one half tall and slender and one half short and fat; a cross section analysis of normal men is not greatly different. Despite the delay in epiphyseal union on long bones in castrates, it cannot yet be stated with exactness that castration greatly alters body proportions.

The fundamental biologic function of sex hormones is unquestionably the conditioning of the accessory reproductive organs to handle the sex products (germ cells) in a manner to insure their proper meeting, and the conditioning of the animal to respond characteristically and at the proper time in a manner to insure propagation of the race. Both functions, it must be admitted, are indispensable for reproduction. In the higher forms of life, however, it becomes apparent that the psychic responses depend on conditions not entirely under the influence of hormones. Thus prepuberally castrated guinea-pigs will exhibit for months strong pursuing tendencies toward females. Stone [38] determined that the white rat will copulate up to five or eight months after castration. It is known that apparently healthy males are often poor service animals, though definitely proved to be secreting normal amounts of hormone by the condition of their accessory reproductive organs. Mating instincts, or the copulatory desires, are extremely complicated and involve so many factors of mentality that it becomes questionable how important testis hormone is in inducing particular psychic states.

Against the concept that mating inclinations in man are lost after castration are the reports of promiscuity of eunuchs. This has been noted many times, and more recently McCartney [39] examined twenty-three eunuchs, finding ten cases of gonorrhea. The mental reaction and psychic state of the problem is well represented by the case of Rowe [40] of a man castrated at 25 years for pathologic reasons, who though previously energetic and widely traveled became an unambitious lethargic individual. The outcome of an interest in a young woman led to marriage nine years after his operation, with entire satisfaction on the part of both partners. His renewed outlook on life was followed by his rehabilitation and the successful pursuit of a new business venture. Psychotherapy in many cases may abolish the preconceived notions of the results of testicular damage, and the conception of the importance of the hormone in psychic conditions in man may have to be completely revised. The castrated man should receive a great deal more study.

Much has been made in medical literature of rejuvenation, increased length of life, mental improvements and the like in man by means supposed to involve changes in hormone production. For centuries man has castrated his domestic animals, even for improvement, yet no one has shown that the life of them, or of castrated man, is shortened; indeed, the eunuch is reported to be a long-lived individual. Neither has castration been shown to be detrimental to an animal other than as concerns breeding powers. Whereas truth may lie in the statement that eunuchs are usually less progressive and energetic than normal men, their social status may play a larger part as a conditioning factor than does the loss of their testis hormone. History records high attainments for eunuchs in government, military and other walks of life. It is yet to be demonstrated that testis hormone in any way sharpens the mentality, prolongs life, aids digestion or sleep or imparts the host of other benefits it is alleged to bestow. Biochemical tests involving metabolism studies, urine analyses, blood chemistry, respiration and the like have so far failed to reveal any consistent development attributable to the absence of testis hormone.

As a final consideration it should be pointed out that from existing evidence testis hormone cannot be considered in any sense a stimulating agent for supposedly hypofunctioning testes; the hormone unquestionably stimulates the accessory reproductive organs but not the gonads themselves. Rather than acting as a stimulating agent on the gonad, injections of hormone in sufficient concentration are actually injurious to gonad tissue present. Injections of estrogenic substance into normal female rats,[41] dogs [42] and monkeys [43] do not stimulate the ovary but are positively injurious. Injection of estrogenic substance into normal males destroys germ cell production and hormone secretion. Testis hormone injected into young normal males suppresses growth of the testis and causes visible injury to the seminiferous tubules; [44] it probably lowers or abolishes hormone secretion, but this cannot be detected since the injection of the hormone more than counterbalances the loss of that produced by the organ itself. The injurious action of the hormones on gonad tissues is believed to be through the hypophysis, making unavailable to the sex gland the necessary substances from the pituitary for normal gonad activity.

In short, the gonad hormones are not gonadal stimulants, nor is the product of any specific endocrine gland a stimulating agent for that gland itself. If testis hormone proves to be of value in the clinic it will no doubt find one application in prepuberal castrates, as a measure adopted to produce evident signs of maturity to relieve the individual of the mental stigma of being markedly different from his fellows. For stimulating greater hormone production in an individual possessing some testis tissue, gonadotropic agents, and not testis hormone, will no doubt become the measure for application. This procedure appears already to have given results of clinical value in certain types of cases.[45]

From this discussion it is no doubt apparent that the question of the clinical value of testis hormone is by no means settled. For attaining dependable results the problem must be considered from the broad point of view of social background and biologic principles. Real advancement must rest on honest critical work rather than on poorly conceived sporadic experimentation with hastily assumed results and unsubstantial claims.

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SUMMARY

The principal sources of testis hormone at present are the testicles of large mammals and human urine.

Testis hormone is obtained from the lipoid fraction and has been sufficiently purified to yield crystals having a high potency.

It appears chemically to be a ketone-alcohol; the only known method of detecting its presence consists in reactions produced in suitable animals.

It is secreted continuously, or periodically, in different animals, and secretion is largely under the control of the pituitary gland.

It is uncertain whether more than one hormone is secreted by the testis.

Its clinical use is questionable; its primary function is the control of the accessory reproductive organs; it is not a testicular stimulant.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

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NOTE.—In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by the various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed, the series will be published in book form.—ED.

THERAPY OF ECLAMPSIA

From a therapeutic[1] point of view, eclampsia might be defined as a condition of metabolite intoxication accompanied by hyperpiesis and a tendency to convulsions. As this syndrome occurs most especially in the course of pregnancy, the therapy of puerperal eclampsia chiefly is indicated here. With elimination of the items of obstetric therapy, this outline of treatment might be equally applicable to nonpuerperal eclampsia, whether it occurs in children, who, next to the puerpera, are most prone to convulsions, or in adults. For treatment of infantile "eclampsia" see Therapy of Spasmophilia.

The functional pathology of eclampsia might possibly be visualized as a toxic angiospasm occurring as a reaction to certain poisons on the part of the system to force greater renal elimination by greater blood perfusion of the kidney. Unfortunately, when angiospasm extends to the brain blood vessels it is likely to cause cerebral edema, increased intracranial pressure and convulsions, and such angiospasm may in turn lead to constriction of renal blood vessels and diminution of urinary elimination. This vicious circle is fatal unless broken in upon by correct therapeutic measures. Its prevention is much more successful than its treatment.

While eclampsia is more prone to result when the kidney tissue is diseased, it may also occur without any serious or permanent renal tissue abnormality.

A puerpera may, of course, have convulsions due to any one of a great many different other causes, as may a patient with nephritis. If all such convulsions were called "eclampsia," the treatment to be discussed here would be erroneous for all the convulsions of other than the sketched pathogenesis. This is the reason why the term "eclampsia" should either be abandoned or else limited to a meaning that has practical value in treatment.

1. Nosology has too largely been dominated by tissue pathology. For purposes of treatment, syndromatic classifications are needed that yield direct and unmistakable therapeutic indications.

PROPHYLAXIS

The prophylaxis of eclampsia is an important part of prenatal care. It requires routine examination every two weeks, during the last months, of blood pressure, urine and body weight, and for edema. Eradication of foci of infection, especially by dental care, should be insisted on.

Blood Pressure.—A tendency to a rise in blood pressure (over 130 systolic, 70 diastolic), especially the diastolic, or excessive gain in weight (over 400 Gm. per week) should at once be met by recording blood pressure readings twice daily and:

1. A salt poor, low protein and low fat diet. An abundance of fruit and vegetables and carbohydrates, milk (at least three glasses a day), a small amount of protein and fat (one helping of meat and one egg daily), a minimum of salt and of spices, and from six to eight glasses of water daily should be taken.

2. Magnesium sulphate purgation, as required.

3. Skin hyperemia production, with its blood pressure reducing tendency. Profuse or exhausting diaphoresis is not intended. (*a*) A general electric light cradle for from fifteen to twenty minutes daily, or to the point of incipient perspiration, followed by a dry pack; or (*b*) a warm bath (100 F.) daily for fifteen minutes, followed by a dry pack; or (*c*) general ultraviolet irradiation with a minimal erythema dose, the lamp at 75 cm. distance, for from two to seven minutes according to the intensity of the rays or the sensitiveness of the patient, to different fourths of the body surface every other day, the various surfaces being irradiated again at each next round for possibly one minute longer until pigmentation or constitutional reaction sets the limit, which may be reached with fifteen minutes' exposure.

4. General regimen. The patient should avoid chilling and reduce her physical and mental activities.

Preeclamptic Stage.—When the blood pressure does not recede promptly or if it exceeds 140 or when either albuminuria (more than a trace) or edema (especially facial) or both add themselves to the hypertension, the patient should be immediately hospitalized. Nonprotein nitrogen estimations, blood chloride determinations (if edema is present), and carbon dioxide combining power tests along with repeated retinoscopy will furnish an index as to progression or regression of the toxemia. Other measures include:

1. Absolute rest in bed, which alone will often do wonders in the reduction of blood pressure and the relief of other symptoms. If the patient is restless, potassium bromide (4 Gm. daily) and chloral hydrate (from 1 to 2 Gm. daily) or phenobarbital (0.10 Gm., two or three times a day) will permit sleep and comfort.

2. Fasting. No feeding should be allowed and moderate drink restriction should be enforced for a day, followed by a salt-poor diet, e. g., oatmeal gruel, and later by a lactovegetarian diet (1,500 calories daily). No tea or coffee should be taken. Edema indicates limitation in fluid intake (to 1,000 cc. a day) until the edema is gone, then gradual increase in the fluid intake, provided the urine elimination increases proportionately.

3. Purgation by magnesium sulphate (30 Gm., best given in ice cold effervescent lemonade) every six hours until watery bowel movements are obtained, then 15 Gm. daily the first thing in the morning.

If the blood pressure goes down and no other symptoms appear, the patient is watched carefully, until term, for recurrence of symptoms. The patient should report at once if disturbance of vision, dizziness or unusual headache should appear.

Threatened Eclampsia.—If, in spite of these measures, the blood pressure, measured three times daily, continues to rise (systolic 150 mm., diastolic pressure 100 or higher) or if increasing toxemia is revealed by the study of the continuous twenty-four hour specimens of urine, the blood tests or other signs or symptoms, such as apathy or restlessness, or the appearance of headache (which need not be severe but is unaccounted for by other causes) or when visual disturbances or epigastric pain associate themselves, the uterus is promptly emptied, as these symptoms may mean the imminence of convulsions within a few hours or days, and as the maternal mortality of actual eclampsia is about 25 per cent and the infantile mortality almost 100 per cent.

Interruption of pregnancy in the preeclamptic stage, the single most important indication of which is the rise in blood pressure, not only saves the mother's life but also prevents subsequent invalidism from resulting permanent kidney impairment if the pregnancy is permitted to continue. Labor may be induced or cesarean section practiced. The method to be chosen for the induction of labor will depend on a number of facts, chiefly the proportion between the size of the fetus and the diameter of the birth canal.

(*a*) If there is no disproportion and the symptoms are not urgent, 60 cc. of Castor Oil given by mouth or through a stomach tube may suffice to induce labor within twenty-four to forty-eight hours. At this time the dose may be repeated, if the first dose failed, provided the symptoms show that there is no urgency.

(*b*) Rupture of the amniotic sac almost invariably succeeds in initiating active labor within twelve to twenty-four hours.

(*c*) Cesarean section should be done in rapidly advancing signs of threatened eclampsia; i. e., threatened eclampsia of an alarming nature, and in definite disproportion between the fetus and the birth canal.

This treatment may seem radical, but it is actually conservative; for at least seven dangers threaten the toxic pregnant woman:

1. Kidney and liver damage.
2. Placental infarction, with death of the fetus.
3. Premature separation of a normally implanted placenta.
4. Temporary or permanent injury to the optic nerve.
5. Bronchopneumonia from aspiration or inhalation anesthesia.
6. Cerebral hemorrhage.
7. Death from eclampsia convulsions and exhaustion.

If these facts were crystallized in their minds, attending physicians would be more particular to start prevention early and to act more promptly in emptying the uterus than most physicians do at the present time.

Labor should be conducted with all possible freedom from pain or trauma. Obstetric analgesia should be practiced during labor to avert the onset of convulsions by giving, for example, Morphine Sulphate (0.015 Gm.) hypodermically, repeated in four hours if required, and Phenobarbital Sodium (0.10 Gm.) by mouth, repeated in two hours and later every four hours, as required.

If, during the second stage, labor becomes very slow or the blood pressure rises, indication for forceps or version is present.

TREATMENT

When convulsions are present, an emergency exists that requires immediate and constant attention. If the convulsion occurs at home, morphine (even 0.03 Gm.) should be given immediately by hypodermic injection, to quiet the patient during transfer to the hospital. The indications may be classified as (1) sedation, (2) hypohydration, (3) support and (4) operation.

1. Sedative treatment consists of the promptest possible administration of morphine hypodermically, chloral by rectum, and magnesium sulphate intravenously.

Morphine Sulphate, 0.015 Gm. by hypodermic injection, is to be repeated in one hour if required, provided the patient has not been given it before; then not oftener than every four or eight hours. Respirations should not be depressed to less than ten per minute. As soon as it can be made ready, one should also give a Chloral Hydrate enema, giving 2 Gm. of chloral for the first dose and a smaller quantity after two hours, and then at intervals of from four to eight hours as required.

Chloral Enema

℞ Chloral hydrate ..... 8.00 Gm.
Mucilage of acacia ..... 30.00 cc.
Water, to make ..... 60.00 cc.

M. Label: Tablespoonful (15 cc.) in 150 cc. of water given slowly by rectum. Give 10 cc. dose after two hours, if required. After this not oftener than every four to eight hours.

Magnesium Sulphate is given slowly intravenously in doses of 20 cc. of 10 per cent solution of the crystalline salt every hour until the convulsions are under control, and subsequently at longer intervals as indicated by blood pressure readings taken hourly. It is contraindicated if there is coma or marked acidosis (carbon dioxide combining power less than 20 volumes per cent). Calcium chloride solution (5 per cent) should be kept in readiness for slow intravenous injection if alarming respiratory depression should occur; 2.5 cc. may suffice to produce immediate improvement. If facilities for intravenous injection are not available, 10 cc. of 25 per cent magnesium sulphate solution may be given intramuscularly.

While all this is going on, noise and visitors are tabu. The greatest possible degree of quiet should be maintained, and the room should be relatively darkened. The patient must not be left alone even for a minute. During convulsions she should be restrained gently to prevent self injury. A towel, clothes pin or gag should be used to prevent biting the tongue. Lateral decubitus and elevation of the foot of the bed should be maintained to permit outward drainage of mucus and saliva and prevent their aspiration. Oxygen inhalation given immediately after each convulsion to relieve the cyanosis promptly is desirable. If mucus and saliva accumulate, these should be removed gently and frequently, best by means of suction apparatus.

2. Hypohydration by phleboclysis of hypertonic dextrose solution is of importance, because in these cases there is a relative hypoglycemia (with liability to liver degeneration) as well as a tendency to cerebral edema. One may give 250 cc. of 25 per cent dextrose solution (slowly, over a period of from thirty to forty-five minutes) and repeat this dose four times daily. It is also important to administer 250 cc. of 25 per cent dextrose solution intravenously shortly (possibly fifteen min-

utés) before the birth of the child, to protect the infant against hypoglycemia, which may be responsible for the high neonatal mortality.

Depletion may have to be practiced simultaneously, as all osmotherapy increases blood volume and tends to raise blood pressure and subthecal pressure secondarily. Hence, guided by the blood pressure and provided the patient is not anemic, one may practice venesection, which must be copious (500 cc.) and performed rather rapidly to produce the result. If opportunity for venesection is not present, or if withdrawal of blood is considered undesirable, sequestration of blood in the limbs (for half an hour at a time) may be of some help.

Lumbar puncture should also be performed if conditions do not seem favorable; and, if the cerebrospinal fluid pressure is high, escape of the fluid should be permitted. This must occur very slowly—literally drop by drop—for fear of herniation of the medulla through the great occipital foramen, which would result in sudden death.

It is obviously nonsensical while such treatment is practiced to "push fluid," as by saline hypodermoclysis. It must also of course be understood that most of this circulation depressing therapy is contraindicated in the presence of definite circulation insufficiency.

3. Supportive treatment may be required, as by cautious and graded administration of fluid as soon as the object of the dehydration treatment has been accomplished. Phleboclysis of from 2 to 3 liters of 5 per cent dextrose in Physiologic Solution of Sodium Chloride until chloride appears in the urine and then of 10 per cent dextrose phleboclysis is likely to be beneficial. If sugar appears in the urine, insulin (see Diabetes) is indicated. A stimulant to the circulation may be needed, such as strophanthin (0.5 mg. intravenously), which may be given in the dextrose phleboclysis.

4. Surgical obstetric intervention, if possible, should not be undertaken until the convulsions have been controlled; for emptying of the uterus does not stop the convulsions, though it usually prevents them. Accouchement forcé is not a part of the treatment of eclampsia. The uterus should be emptied without violence. Even low forceps application is done reluctantly and never with ether anesthesia, because of danger of pneumonia. Antemortem cesarean section is rarely needed, because the child is usually dead at such a time.

Kidney decapsulation may possibly save the life of a patient with deep coma and anuria, when other measures seem to fail.

POSTPARTUM CARE

As in any severe case of preeclamptic toxemia convulsions may occur from twenty-four to forty-eight hours after delivery, sedative and other measures as described should be continued for several days. It is well to give as a routine, soon after labor, a hypodermic injection of Morphine Sulphate 0.015 Gm.

Blood pressure readings and the urinary output should be recorded daily.

The blood should be examined for nonprotein nitrogen retention.

The low protein and salt poor diet should be continued until edema has disappeared. Then fluid should be given freely, provided the kidney can respond to the appeal.

If the blood pressure and urine do not return to normal within two weeks after delivery, the therapy of nephritis (q. v.) is indicated.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS STIMULATED THE INVESTIGATION OF SHORT WAVE DIATHERMY AND THE THERAPEUTIC CLAIMS MADE FOR IT IN ORDER THAT THE MEDICAL PROFESSION MAY NOT BE MISLED INTO BELIEVING THAT THIS FORM OF THERAPY HAS UNUSUAL HEALING POWERS AND OTHER CLINICAL ADVANTAGES. THE COUNCIL FEELS THAT IN THIS AS IN ALL OTHER FORMS OF MACHINE THERAPY THE THERAPEUTIC CLAIMS MUST BE SUBSTANTIATED BEFORE THE MACHINES ARE ACCEPTED. IT FEELS THAT, BY THIS STUDY AND BY SIMILAR STUDY OF OTHER NEW PHYSICAL THERAPY APPARATUS, THE PROFESSION CAN BE MOST GREATLY BENEFITED. THE COUNCIL HAS THEREFORE AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.

HOWARD A. CARTER, Secretary.

TISSUE HEATING BY SHORT WAVE DIATHERMY

SOME BIOLOGIC OBSERVATIONS

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The introduction into physical therapy of apparatus generating high frequency electric and electromagnetic currents (now becoming generally known as short wave diathermy) has aroused a wide response and has stimulated much investigation. There is an increasing interest and literature on the use and effects of these currents, but the multiplicity of therapeutic claims and the varieties of nomenclature have served rather to confuse the issue. The observations, if confirmed, may obviously have a wide range of interest and application in biology and medicine. Consequently it is especially necessary to approach the entire subject with a healthy skepticism in order to make an impartial critical evaluation.

The chief claims for short wave diathermy revolve about the following points:

1. Greater and more uniform penetration of heat into the body.
2. Special selective thermal action.
3. Specific biologic action.
4. Specific bactericidal action.

1. *Greater and More Uniform Penetration of Heat into the Body.*—It is not entirely clear to us what is meant by "deeper thermal penetration" (as the advertisements read), since there is no adequate method of measuring this factor in the living body. The comparison of short wave radiation with roentgen radiation is, we believe, entirely fallacious and misleading. The production of heat in any organ of the body in a short wave field is not a static affair, as will be brought out later. Likewise, there is no evidence to support the claim that the thermal gradient observed with conventional diathermy is reversed when short wave diathermy machines are substituted.

The experiments on which the claims of uniform and penetrating heating have been based are all phantom model or other in vitro experiments of the nature of the work of Pariseau.[1] This investigator, using agar-salt mixtures and a heat sensitive substance, tetraiodomercuriate of silver (which is canary yellow when cold and orange red when hot) as an indicator, has attempted

Aided by a grant from the Council on Physical Therapy of the American Medical Association.

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1. Pariseau, L. E.: Canad. M. A. J. 20:146 (Feb.) 1929.

to show the heat distribution by the color change. The interpretation of the results of this work is open to serious criticism. In the first place, the color of the indicator changes quickly when the temperature is raised above its critical point; in the second place, as Pariseau himself warns, a uniformly colored field does not mean a uniformly heated field. Furthermore, it is difficult to see how results obtained from experiments on beefsteak or on amputated limbs, which, devoid of circulation and nerve supply, are not even approximately representative of the actual physiologic conditions, can be validly applied to the living body. We do not believe it is possible to predict, from phantom model experiments, the response of the living body, with its variety of reactions and compensatory mechanisms, to this form of energy.

2. *Special Selective Thermal Action.*—From a mathematical and physical study of the heating of electrolytes in high frequency fields, McLennan and Burton [2] and later Pätzold [3] and Reiter [4] have shown that the heating depends on the specific conductivity of the liquid and rises to a maximum for a certain conductivity. This maximum is the more marked the higher the frequency. The conductivity at which the maximum effect occurs is shown to be proportional to the frequency. The distribution of the field in the interior of a heterogeneous body is determined largely by the dielectric constant and the heating by the conductivities. For a given wavelength there is a maximum heating effect produced in a medium, the specific conductivity and dielectric constant of which are connected with the frequency by the relation $2C = nK$, C being the specific conductivity in absolute units, K the dielectric constant, and n the frequency.

Extending this mathematical and physical relationship to the body, McLennan and Burton [5] suggest that a selective heating effect is possible from a knowledge of the characteristic electrical constants of the substances of the body, and by suitable choice of wavelength the heating of a particular part of a heterogeneous body may be favored over that of neighboring regions.

However, there are at least two very serious and insurmountable limitations to this concept, one being the extent to which temperature per se operates on conductivity to increase this factor. Frequencies that might show selective heating at room temperature might be much less effective at body temperature and still less so as the tissue temperature rises as a result of the treatment, since the conductivity rises with temperature. Secondly, as one of us [6] has shown, the blood flow and the rapid interchange of heat in the living body may render the differences of temperature negligible for all practical purposes, which McLennan and Burton themselves also point out.

Schliephake's [7] work as well as that of others [8] on selective thermal action and uniform and penetrating heating has been done mostly on dead tissue and tissue outside the living body, and as Schliephake himself says: "It remains for further studies to determine the presence or absence of parallel selective reactions in the living human; hence final conclusions from the facts can be drawn only after comparison with similar observations in living human material."

3. *Specific Biologic Action.*—Among the first to suggest specific biologic effects of currents of high frequency were Gosset and his co-workers,[9] who reported that various types of plant tumors when subjected to massive exposures in a 2 meter field were killed, death being preceded by an acceleration in their rate of growth. Later Schereschewsky,[10] working with a transplantable Rous sarcoma in mice, reported that he had shown a maximum lethal action between wavelengths of 3.75 and 15 meters. He stated that the tumors did not feel hot but that, on the other hand, the microscopic picture of them suggested coagulation necrosis. Recently, Pflomm [11] asserted that he reduced the toxicity of a rat sarcoma by the use of a 3.2 meter wave, the tumor receding in size until the thirty-eighth day, after which it began to grow again.

The earlier work has been reviewed before [6] and need not be repeated, except to say that, aside from the report of Mellon, Szymanowski and Hicks, which needs confirmation, that they secured a definite attenuation of diphtheria toxin independent of the heat factor, there is not sufficient evidence to suggest an effect other than that of heat.

Schereschewsky [12] has lately reviewed his earlier work and has come to the conclusion that the sarcoma was killed by the heat generated in the tissue and that there was no evidence for specific lethal action of the radiation. Ross [13] exposed twenty-two chickens inoculated with the Rous sarcoma to a 29 meter wave and reports that the duration of life was not prolonged and the growth of the tumor was not retarded. Haas and Lob [14] used a 2.8 and 20 meter wave in the treatment of malignant tumors and observed no specific effects.

Other recent observations on the effect of exposure to high frequency currents include the work of Jellinek,[15] who claims an increase over the controls in the weight of new-born mice that were exposed to a 3 meter wave four times daily for one hour at a time, and of Knudson and Schaible,[16] who exposed white rats to currents of from 25 to 33.3 meters for from half an hour to one hour daily, raising the temperature to 40.5 C., and found no retardation of growth or change in the power to breed. These experimenters also [17] exposed dogs to the same high frequency currents for from thirty to sixty minutes and found that the chemical changes in the blood were referable to the concentration resulting from the dehydration. The effect of high frequency currents on the oxygen consumption of frog muscle was studied by Fenn and Latchford,[18] using 3.2 and 27 meters. They report no special effect that could not be attributed to the heating effect of

2. McLennan, J. C., and Burton, A. C.: Canad. J. Research 5: 224, 1930.
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4. Reiter, Y.: Brit. J. Phys. Med. 1: 119 (Dec.) 1933.
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10. Schereschewsky, J. W.: Pub. Health Rep. 45: 1939 (Sept. 10) 1930. Schereschewsky, J. W., and Andervont, H. B., ibid. 48: 527 (April 29) 1933.
11. Pflomm, Erich: München. med. Wchnschr. 77: 1854 (Oct. 24) 1930.
12. Schereschewsky, J. W.: Radiology 30: 246 (April) 1933.
13. Ross, J. R.: Am. J. Cancer 15: 903 (Aug.) 1931.
14. Haas, M., and Lob: Strahlentherapie 50: 345 (June) 1934.
15. Jellinek, Stefan: Wien. klin. Wchnschr. 43: 1393 (Dec. 25) 1930.
16. Knudson, Arthur, and Schaible, P. J.: Effect of Exposure to an Ultra-High Frequency Field on Growth and on Reproduction in the White Rat, Arch. Path. 15: 723 (May) 1933.
17. Knudson, Arthur, and Schaible, P. J.: Physiologic and Histological Changes Resulting from Exposure to an Ultra-High Frequency Field, Arch. Path. 15: 728 (May) 1933.
18. Fenn, W. O., and Latchford, W. B.: Am. J. Physiol. 99: 680 (Feb.) 1932.

the current. Nasset and his co-workers[19] have made an extensive study of the physiologic effects of diathermy currents of 300 meters (diathermy) and 30 meters (short wave) on anesthetised dogs and report that at the higher temperature of from 42 to 44 C. the protein metabolism, judged from the urea production, may be doubled with no evidence of a disturbance to endogenous protein metabolism.

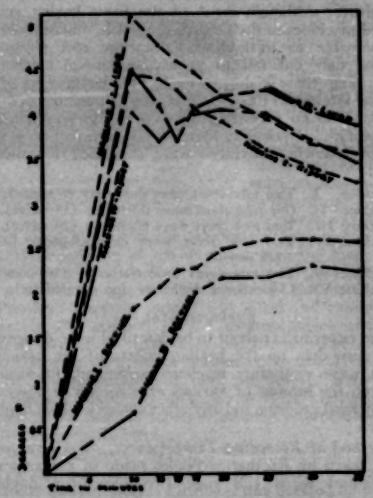

Fig. 1.—Heating of tissues of anesthetised dog (average of twelve). Current through thorax for ten minutes. Average rise in skin (average of twelve): machine I, 14.14 degrees F.; machine IV, 15.73 degrees. Average rise in lung (average of eleven): machine I, 5.94 degrees; machine IV, 5.3 degrees.

Bierman and Fishberg[20] have recently reviewed the physiologic changes in the body during hyperpyrexia.

The tissues of guinea-pigs, dogs and rats, after exposure to a 25 meter radiation during which the maximum temperature rose to from 107.5 to 112.4 F., were examined pathologically by Jacobsen and Hosoi,[21] and the changes found were the same as in fever produced by other methods.

4. *Specific Bactericidal Action.*—Many studies have been carried out to determine whether the high frequency currents have any specific lethal effect on bacteria. Much literature has accumulated stemming largely from the writings of Schliephake. With a co-worker, Haase, he reported[22] a selective lethal action with specific wavelengths on various micro-organisms in vitro at 37 C. This work was extended by Liebesny and his co-workers,[23] who postulate that for every kind of bacteria there is a definite wavelength which has the most harmful effect and most quickly destroys the bacteria. He goes on further to say that the growth of certain micro-organisms can even be promoted by certain wavelengths.

Confirmation of this work is lacking. On the other hand, much evidence is at hand in refutation. In this country Hicks and Szymanowski,[24] working with 2.5 meters on streptococci, staphylococci, B. diphtheriae, bacteriophage, and precipitating antibody for pneumococcus, on the course of experimental infection in animals, on specific desensitization, and on immunization by irradiated toxins, explain the effects on the basis of elevation of temperature produced. Izar and Famulari,[25] working with 4, 8 and 15 meters on B. typhosus, paratyphosus, dysentery Shiga, Ceylon A and B, and proteus X, report these micro-organisms unaffected by a twenty minute treatment. Groag and Tomberg,[26] in analyzing the results of Haase and Schliephake that bacteria in culture are killed at 37 C. by exposure to the short wave field, bring out the interesting explanation that because of "point heating" (similar to the phenomenon described by Esau in his oil and water emulsion in which steam escapes after exposure to the field even though the temperature of the emulsion is only 60-70 C.) the bacteria may be brought above their thermal death point, which is essentially higher than the temperature of the surrounding medium. They remark that it is not necessary, as Haase and Schliephake do, to invoke a new mechanism as a specific lethal action of short waves, which action in

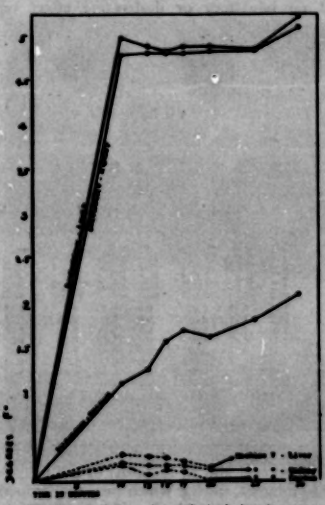

Fig. 2.—Heating of tissues of anesthetised dog (average of twelve). Current through thorax for ten minutes. Average rise in skin (average of seven): machine V, 3.1 degrees F.; diathermy, 7.8 degrees. Average rise in lung (average of eight): machine V, 0.9 degree; diathermy, 6.54 degrees.

no wise was proved by their experiments. Groag and Tomberg repeated the work of Liebesny with the 4 meter and 15 meter wave on Actinomyces bovis, Trichophyton tonsurans and B. coli, and reached the

19. Nasset, E. S.: Am. J. Physiol. 103:194, 203 (June) 1933. Karr, J. W., and Nasset, E. S., ibid. 107:170 (Jan.) 1934.
20. Bierman, William, and Fishberg, E. H.: Some Physiologic Changes During Hyperpyrexia Induced by Physical Means, J. A. M. A. 102:1254 (Nov. 3) 1934.
21. Jacobsen, V. C., and Hosoi, Kiyoshi: Morphologic Changes in Animal Tissue Due to Heating by an Ultra-High Frequency Oscillator, Arch. Path. 15:744 (May) 1933.
22. Haase, W., and Schliephake, E.: Strahlentherapie 40:133, 1931.
23. Liebesny, P.; Schenk, H., and Werdnig, H.: Klin. Wchnschr. 12:141 (Jan. 28) 1933.
24. Hicks, R. A., and Szymanowski, W. T.: J. Infect. Dis. 50:464 (May-June) 1932.
25. Izar, G., and Famulari, S.: Riforma med. 48:1489 (Oct.) 1932.
26. Groag, P., and Tomberg, V.: Wien. klin. Wchnschr. 47:365 (March 2) 1934.

conclusion that the destruction of cultures by means of short waves is possible in every case so long as the electrical energy of the field suffices to generate the necessary point heat that brings the organisms above their thermal death point. Liebesny's other observations that bacterial growth may be promoted by short waves may also be explained by "point heating," which raises the temperature of the micro-organisms to their optimum temperature for growth.

Fig. 3.—Heating of tissues of anesthetized dog (average of twelve). Current through thorax for ten minutes. Average rise in skin (average of eight): machine III, 7.96 degrees F.; machine II, 3.4 degrees. Average rise in lung (average of eight): machine III, 1.81 degrees; machine II, 1.1 degrees. Machine II, no change in rectal temperature.

Hasché and Leunig [27] exposed cultures of staphylococci and streptococci in distilled water, saline solution, bouillon and milk and on agar plates to short waves (from 8 to 16 meters) of different intensities for periods of time up to eight and one-half hours and observed no inhibitory or destructive effect on the bacteria.

Eidinow [28] submitted suspensions of bacteria in serum to 3 and 4 meter waves, eliminating the heating effect, and reports that he was unable to demonstrate any bactericidal action.

In our own laboratory we have subjected broth cultures of staphylococci, streptococci, B. melitensis, gonococci, meningococci and B. typhosus to a 6 meter wave for twenty minutes, during which time the temperature of the culture rose to 40 C. without observing any change in the growth of the micro-organism. We have also subjected rats with experimental pneumonia for three minutes daily to the 6 meter wave without observing any change in the fatal course.

It becomes increasingly clear from a careful scrutiny and study of the literature that much scrupulously controlled experimentation must be performed before specific effects of high frequency currents can be postulated. At present the results obtained can be fully explained, we believe, on the basis of the heat generated.

In view of the fact that many requests have been received for information regarding the therapeutic efficacy and physical characteristics of short wave diathermy apparatus, the Council was obliged to undertake investigations that would either confirm or refute the claims made in the advertising matter and descriptive literature. Although some of the firms having submitted machines to the Council did not hesitate to make questionable or misleading therapeutic and physical claims, they did fail to present conclusive evidence confirming these claims. Therefore, because of the intense interest in this new field, the Council deemed it advisable to go forward with certain investigations to substantiate, if possible, the claims made.

The following machines were submitted for these tests:

Machine	I.	Two tube short wave diathermy (6 meter).
Machine	II.	One tube short wave diathermy (15 meter).
Machine	III.	Two tube short wave diathermy (24 meter).
Machine	IV.	Two tube short wave electromagnetic field (25 meter).
Machine	V.	Two tube short wave diathermy (16 meter).
Machine	VI.	Conventional diathermy for comparison.

EXPERIMENTAL

The experiments about to be described were designed to secure data on the heating effects of the various short wave diathermy machines submitted, to secure data on the heating of various organs, and to observe the thermal gradient and any other changes which might occur.

Method of Recording Temperatures.—Temperatures were taken by six thermocouples made of copper and constantan wires (28 gage Leeds-Northrup double cotton covered), soldered into the tip of a 16 gage lumbar puncture needle. The thermocouples were connected to the potentiometer (Leeds-Northrup portable precision type) through parallel double pole switches, a method that facilitated rapid reading of the individual couple.

The thermocouples were calibrated against a Bureau of Standards calibrated thermometer with scale division in one-tenth degree F.

Since the thermocouple itself is affected by the high frequency currents, there were no thermocouples in place in the field during the passage of the current.

A. *Heating of the Tissues of the Dog (Anesthetized).*—The determinations of the heating effects of

Temperature Rise in Degrees F. in Various Organs of the Dog After Ten Minutes' Exposure to Short Wave Diathermy

Time in Minutes	Machine I 6 Meters			Machine II 15 Meters			Machine III 24 Meters			Machine IV Electromagnetic Field 25 Meters			Machine V 16 Meters			Diathermy		
	Rectum (Av. 12)	Liver and Lung (Av. 12)	Kidney and Heart (Av. 12)	Rectum (Av. 12)	Liver and Lung (Av. 12)	Kidney and Heart (Av. 12)	Rectum (Av. 14)	Liver and Lung (Av. 14)	Kidney and Heart (Av. 14)	Rectum (Av. 16)	Liver and Lung (Av. 16)	Kidney and Heart (Av. 16)	Rectum (Av. 12)	Liver and Lung (Av. 12)	Kidney and Heart (Av. 12)	Rectum (Av. 12)	Liver and Lung (Av. 12)	Kidney and Heart (Av. 12)
10	1.80	5.11	4.60	0.0	0.7	0.5	0.50	1.47	1.05	0.67	4.5	4.02	0.17	0.2	0.2	1.1	5.0	4.01
12	2.07	4.77	4.09	0.0	0.0	0.59	0.57	1.53	1.28	1.52	5.1	3.69	0.33	0.59	0.17	1.27	4.9	4.08
15	2.16	4.69	4.17	0.0	0.45	0.68	0.68	1.25	1.26	1.61	5.7	4.09	0.33	0.59	0.17	1.27	4.98	4.08
17	2.25	4.67	4.07	0.0	0.41	0.64	0.51	1.11	1.10	2.01	4.89	4.01	0.10	0.59	0.17	1.7	4.89	4.08
20	2.40	4.51	3.99	0.0	0.40	0.65	0.57	1.09	1.05	2.17	4.9	4.04	0.00	0.16	0.14	1.68	4.89	4.08
25	2.36	4.64	3.99	0.0	0.31	0.58	0.54	0.94	1.01	2.16	4.57	4.0	0.00	....	....	1.68	4.87	4.08
30	2.36	4.68	3.99	0.0	0.25	0.54	0.54	0.89	0.9	2.20	4.66	3.7	0.00	....	....	2.1	4.68	4.2
35	2.37	4.54	3.98	...	....	....	....	....	....	2.25	4.67	3.66						
	Rise in skin = 14.14 (Av. 7)			Rise in skin = 3.4 (Av. 8)			Rise in skin = 7.90 (Av. 10)			Rise in skin = 15.75 (Av. 12)			Rise in skin = 3.1 (Av. 7)			Rise in skin = 7.0 (Av. 7)		
	Rise in lung = 5.94 (Av. 10)			Rise in lung = 1.1 (Av. 8)			Rise in lung = 1.81 (Av. 7)			Rise in lung = 5.3 (Av. 11)			Rise in lung = 0.9 (Av. 6)			Rise in lung = 6.84 (Av. 8)		

27. Hasché, E., and Leunig, H.: Strahlentherapie 39: 351 (June) 1931.

28. Eidinow, Albert: Proc. Royal Soc. Med. 28: 307 (Jan.) 1935.

short wave diathermy and conventional diathermy were made on dogs anesthetized with pentobarbital sodium, 30 mg. per kilogram, reenforced by small additional doses whenever necessary. For the determination of the temperature changes in the viscera, the dog was laparotomized and a thermocouple inserted into the selected organ. With the liver and spleen the thermocouples were held in place by stitching to the peritoneum; for the kidney the thermocouple was inserted through the flank and held in place by stitching to the skin, after the kidney had been immobilized by stitching the capsule to the peritoneum; the thermocouple in the duodenum was fastened by securing it to the serosa. The abdomen was then closed surgically. For the temperature changes in the skin, in the muscle of the thorax and in the lung, the thermocouple was inserted into the same place before and after the passage of the current. At the conclusion of the day's tests the animal was killed and examined to verify the position of the thermocouples and to observe any gross changes in the tissue. The slight disturbance in each organ occasioned by the insertion of the thermocouple does not, we believe, alter the physiologic conditions enough to give misleading results, as the thermocouples responded instantaneously to any temperature changes.

Fig. 4.—Cannulas in right thigh. Medial cannula in quadriceps extensor and lateral cannula in subcutaneous tissues.

The pad electrodes were applied to each side of the thorax and were separated from the skin by a 15 mm. thickness of felt. (This thickness was decided on after many trials.) The dogs were subjected for ten minutes to the maximum output obtainable from each machine. In clinical practice, as will be brought out later, it is not always possible or desirable to utilize the maximum output, as the patient cannot tolerate it. For this comparative study, however, bearing in mind the limitations of the application, the maximum field was used for the following reasons: With several of the machines submitted for these tests, less than the maximum output produced no observable temperature or other changes. Thus by using the maximum output a very troublesome variable factor, the tolerance dosage, was eliminated and it became possible to observe the response of living tissue to this form of energy. With diathermy, metal electrodes of the same area as the pad electrodes, separated from the skin by a 15 mm. thickness of cellucotton soaked in 10 per cent solution of sodium chloride, were used. For the application of the electromagnetic field the cable was wound with four turns round the thorax.

The six machines were used in rotation on each dog, sufficient time being allowed between tests to permit the animal to cool (sometimes in the icebox) and return to thermal equilibrium. In this way, strictly comparable results were obtained on the same animal. Likewise by rotation no machine enjoyed any undue advantage of position, if such existed.

The results of these experiments are shown in the accompanying table and figures 1, 2 and 3. Twelve complete experiments were performed and several partial ones in which not all the machines were used.

With the current applied across the thorax it was found that at the end of the irradiation the temperature of the skin and muscles of the thorax had risen considerably; the temperature in the lungs was somewhat less than that of the muscles. There existed a definite thermal gradient from the skin inward. At the same time the liver, kidney, spleen and duodenum heated to a lesser degree but each organ named underwent almost the same elevation in temperature, even though the last three organs were never in the short wave field and only part of the liver was. It is interesting to note that the body temperature, as indicated by rectal temperature, rose as the other organs lost heat. This illustrates the remarkable efficiency of the rapid heat interchange in the body, and the distribution of heat by the blood and other circulating fluids.

From our experiments with the short wave diathermy on anesthetized dogs we were unable to observe any greater penetration of heat or more uniform heating than with the conventional diathermy.

Attempts were made with several animals to obtain temperatures within the bones of the foreleg, but the trauma incident to drilling into the bone so disturbed the circulation as to produce a temporary stasis, which vitiated the results.

It should be pointed out again that in these experiments the complete output of the machines was used. Clinically, this is seldom possible owing to the limitation of skin tolerance, but in these experiments it was necessary for comparative purposes. Thus a machine with a high output is not necessarily desirable, since it might not be possible to use all the available energy for any local treatment in which the dosage is always necessarily regulated and limited by skin tolerance.

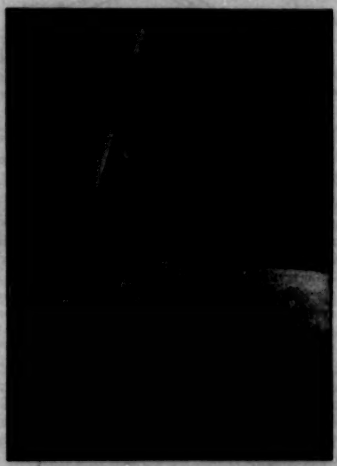

Fig. 5.—Roentgenographic appearance of cannulas in thigh.

The importance of skin tolerance in the application of these high frequency currents cannot be overemphasized. This is strikingly brought out in the experiments on the human subjects.

B. *Heating of the Tissues of Man.*—Experiments were similarly conducted on the thigh of human beings.

Under aseptic precautions a nonmagnetic, nonconducting sheath (through which the thermocouple needle could be guided for temperature readings) was inserted subcutaneously and into the quadriceps extensor (figs. 4 and 5). Temperatures of the skin, of the subcutaneous tissue, of the muscle and of the mouth were taken before and after a twenty minute clinical application.

Since the success of the utilization of this new form of energy depends to some degree on the proper technic

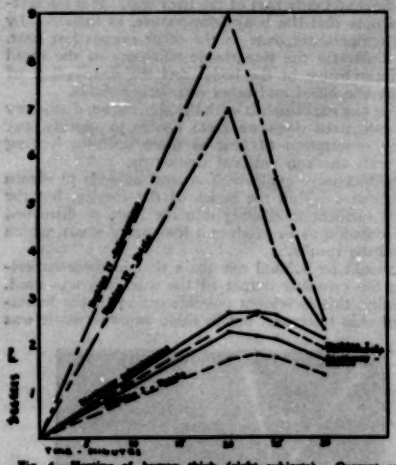

Fig. 6.—Heating of human thigh (eight subjects). Current on for twenty minutes. Average rise in skin: machine I, 7.9 degrees F.; machine IV, 6.36 degrees; diathermy, 6.7 degrees. Average rise in mouth: machine I, 0.3 degree; machine IV, 0.7 degree; diathermy, 0.35 degree.

of application, a representative of each manufacturer was present at one or more of these tests for advice and guidance. With the pads, varying thicknesses of felt and bath toweling were used. For the application of the electromagnetic field, four turns of the cable were used, the thigh being covered with two thicknesses of bath towel. The surface next to the skin of the metal electrode of the diathermy was coated with a thin layer of K-Y jelly to insure better contact.

The six machines were used in rotation on the thigh, sufficient time being allowed between for return to thermal equilibrium. In these experiments the dosage was regulated entirely by the tolerance of the patient. With several of the machines and with diathermy, the maximum output could not be utilized for this local treatment.

The results of these tests on eight human subjects (male) are shown in figures 6 and 7. It is seen that there is a greater rise in the temperature of the subcutaneous tissue than in the underlying muscle, that the temperature of the skin rises markedly, and that the body strives to dissipate and distribute the heat as rapidly as possible, as shown by the rise in the mouth temperature and rapid drop in the skin temperature. There appears to be a thermal gradient in the tissues of the thigh following short wave diathermy. There does not appear to be any selective thermal action or any evidence of more uniform heating. The short wave machines, except one, do not appear to have any advantage over diathermy in the heating of body tissues; actually most of them are inferior.

In connection with machine IV, it appears from figure 6 that the skin does not become as hot as the subcutaneous tissue; but this is due, we believe, to two factors: 1. The coil cannot be as closely applied to the thigh as the pads and hence the skin has the opportunity to lose heat by radiation. 2. Owing to the greater rise in the temperature of all the tissues in the field and to the rise in body temperature, sweating occurs on the thigh and as a result there is a further cooling effect from the evaporation of the sweat. In this connection the question must be raised as to whether it is physiologically or therapeutically desirable to subject tissue to such marked temperature changes in such a short space of time, although this could be controlled by using less than the maximum output of this machine.

During the course of this investigation cuff electrodes, which did not come with the original model submitted, were sent in for trial by one manufacturer. With the cuff electrodes applied to the thigh, the following temperature increases were obtained (average of three tests): subcutaneous, 5.4 degrees F.; muscle, 4.8 degrees; skin, 5.4 degrees; mouth, 0.53 degree.

The full clinical discussion of the therapeutic indications, applications and limitations of these new high frequency currents will follow in another article.

SUMMARY AND CONCLUSIONS

Experiments have been performed on twelve anesthetized dogs and on the thigh of eight human subjects to study and measure the heating effects of short wave diathermy and to observe any other changes that might occur. Five short wave machines were used, a 6 meter, 15 meter, 16 meter, 24 meter, 25 meter and the conventional spark-gap diathermy.

1. There is no conclusive evidence from the literature nor were we able to substantiate the claim of specific biologic action of high frequency currents (short wave diathermy). In our opinion the burden of proof still lies on those who claim any biologic action of these currents other than heat production.

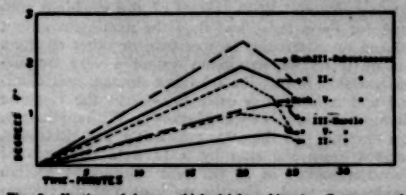

Fig. 7.—Heating of human thigh (eight subjects). Current on for twenty minutes. Average rise in skin: machine II, 5.7 degrees F.; machine III, 6.3 degrees; machine V, 6.2 degrees. Average rise in mouth; machine II, 0.01 degree; machine III, 0.07 degree; machine V, 0.07 degree.

2. The experimental work that claims specific bactericidal action for these high frequency currents may be more rationally explained, we believe, on the basis of "point heating," which raises the temperature of the micro-organisms above their thermal death point without a corresponding elevation in the temperature of the medium. It still remains to be demonstrated whether such test tube results can be secured with infection in the body.

3. Our own work on the machines submitted shows that there is a thermal gradient from the hot skin to the less hot tissues within.

4. There is no evidence from reliable experimental work on living subjects that short wave diathermy possesses a more uniform penetration of heat into the body than the conventional diathermy.

5. The possibility of special selective thermal action is a very remote one.

6. We do not believe that it is possible to predict the response of the body to high frequency currents from phantom model or other in vitro experiments.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HEINTZE, Secretary.

BONNIE BRAND GOLDEN SYRUP

Manufacturer.—The Pioneer Maple Products Company, St. Paul.

Description.—A table syrup; corn syrup with refiners' syrup; flavored with vanilla extract.

Manufacture.—Corn syrup and refiners' syrups, as received from the manufacturers, are mixed, heated to 88 C., tested for proper consistency and allowed to stand thirty minutes, after which time the vanilla is added. The syrup is automatically filled into friction top cans and sealed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	24.3
Ash	1.0
Fat (ether extract)	0.0
Protein (N × 6.25)	0.1
Reducing sugar as dextrose before inversion	31.6
Sucrose	4.7
Dextrins (by difference)	38.4
Acidity as HCl	0.02
Sulphur dioxide	0.0016
ph	5.6

(No methods are available for accurately determining the composition of syrups of this nature; therefore the foregoing analysis is roughly approximate.)

Calories.—1 per gram; 85 per ounce.

Claims of Manufacturer.—Recommended for use as an easily digestible and readily assimilable carbohydrate supplement to milk in infant feeding and as a syrup for cooking, baking and the table.

FRIGID ZONE CRAB

Distributor.—Alaska Salmon Company, San Francisco.

Packer.—Alaskan Glacier Sea Food Company, Petersburg, Alaska, and Seattle, Wash.

Description.—Canned cooked meat of Alaska crabs.

Manufacture.—The crabs are caught in open salt water fishing beds in Alaska 15 miles from the nearest settlement. On receipt at the cannery the crabs are inspected and only those alive are used, which are held in bins until inactive, are butchered, the backs are removed, and the crabs are eviscerated, thoroughly washed and boiled for fourteen to twenty minutes. The meat is removed from the shells, washed with dilute acetic acid solution and then with water, dipped into concentrated salt solution and packed by hand in enameled cans lined with parchment paper. The cans are sealed under vacuum and processed ninety minutes at 110 C. The canned meat averages 60 per cent leg meat and 40 per cent body meat. Eight hours elapse between catching and canning. Operators handling the meat wear canvas gloves.

Analysis (submitted by packer):

	per cent
Moisture	77.2
Total solids	22.8
Ash	3.9
Fat (ether extract)	0.5
Protein (N × 6.25)	19.5
Carbohydrates (by difference)	0.0
Copper (Cu)	3 parts per million
Iodine (I)	743 parts per billion
Manganese (Mn)	13 parts per million

Calories.—0.8 per gram; 23 per ounce.

Claims of Manufacturer.—Good dietary source of iodine.

WARRANTY SIEVED PEAS

Manufacturer.—The Nielsen Corporation, Ltd., Oakland, Calif.

Description.—Sieved peas prepared by efficient methods for retention in high degree of the natural mineral and vitamin values. No added sugar or salt.

Manufacture.—Fresh peas as received from the field are shelled, thoroughly washed, and subsequently processed and canned by essentially the same procedure as described for Warranty Sieved Spinach (THE JOURNAL, Feb. 2, 1935, p. 399).

Analysis (submitted by manufacturer).—

	per cent
Moisture	82.8
Total solids	17.2
Ash	0.6
Sodium chloride	0.85
Fat (ether extract)	0.5
Protein (N × 6.25)	4.6
Reducing sugars as invert sugar	0.1
Sucrose	4.3
Starch	3.3
Crude fiber	1.7
Carbohydrates other than crude fiber (by difference)	9.8

Calories.—0.6 per gram; 17 per ounce.

Vitamins.—The method of preparation and processing insures the retention in high degree of the natural vitamin values.

Claims of Manufacturer.—Specially intended for infants, children and convalescents, and for special smooth diets. Only warming is required for serving.

CELLU JUICE-PAK BLUEBERRIES

PACKED IN UNDILUTED JUICE WITHOUT ADDED SUGAR

Distributor.—The Chicago Dietetic Supply House, Inc., Chicago.

Packer.—Loggie & Company, Island Pond, Vt.

Description.—Processed blueberries packed in undiluted juice without added sugar.

Manufacture.—Ripe blueberries are cleaned with a fanning machine, conveyed to the factory, inspected by a government inspector for presence of worms, thoroughly cleaned of leaves and dirt by machine and hand, washed, cooked, filled into cans and automatically sealed. Before shipment, the cans are inspected and labeled.

Analysis (submitted by distributor).—

	per cent
Moisture	86.9
Ash	0.4
Fat (ether extract)	0.6
Protein (N × 6.25)	0.7
Reducing sugars as invert sugar	4.7
Crude fiber	1.5
Carbohydrates other than crude fiber (by difference)	9.9

Calories.—0.5 per gram; 14 per ounce.

Claims of Distributor.—Packed in undiluted blueberry juice without added sugar.

OMAR WONDER FLOUR

Manufacturer.—Omaha Flour Mills Company, Omaha.

Description.—Patent flour milled from washed hard winter wheat; bleached.

Manufacture.—Selected hard winter wheat is cleaned, washed, tempered, scoured and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended and bleached with a mixture of benzoyl peroxide and calcium phosphate (0.33 ounce per barrel) and nitrogen trichloride (3.6 Gm. per barrel).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 20, 1935

THE PROBLEM OF MYELOMA

William McIntyre,[1] an English physician, published in 1850 the report of a case of "mollities and fragilitas ossium." His description of the onset with vague neuritic pains, the occurrence of spontaneous fractures of two ribs, and of the later evolution and course of the disease combine to give a typical clinical picture of a multiple myeloma. In addition, he made an interesting observation of the peculiar "altered condition of the urine." At his request Bence-Jones[2] made a study of the patient's urine and confirmed his observations. Addition of nitric acid cleared the urine, but a yellowish coagulum formed about one and one-half hours later, which, however, redissolved on application of heat and precipitated out again on cooling. The effect of boiling was to redissolve the coagulum. The postmortem examination with a particular study of the involved ribs was made by Dalrymple.[3] McIntyre called attention to the essentially malignant character of the condition, though he felt that it did not act in all respects as a true neoplasm.

In 1873 von Rustizky,[4] working in von Recklinghausen's pathologic institute in Strasbourg, reported a careful postmortem study of a case of multiple tumors of the bones of the trunk. According to him, similar cases were mentioned by Virchow, who, however, considered them cases of myelogenous sarcoma. To von Rustizky belongs the credit of proposing the name myeloma for the condition. To complicate further the questions of terminology and priority, Bozzolo[5] in his work referred to the careful description of the clinical symptoms of the disease by Kahler[6] and proposed that it be called Kahler's disease. Recent contributors used the hardly justifiable term Kahler-Bozzolo disease alternately with that of multiple myeloma.

The clinical characters of myeloma are those of an insidious onset with vague neuritic pains, progressive anemia, multiple involvement by tumor of the skeletal trunk, pathologic fractures, most characteristically of a rib, backache with signs of involvement of the spinal cord, and the presence of Bence-Jones bodies in the urine. The prognosis is hopeless, the patients dying on an average two years after recognition of the condition. Classification of the tumor on a histologic basis appears not to have any value in the case of myeloma. The designation erythroblastoma, lymphoblastoma or plasmocytoma, because of the preponderance respectively of immature red cells, lymphocytes or plasma cells, carries little significance. The essential histologic feature of the tumor is that it is made up of all the immature elements of the bone marrow. Abrikosov[7] described the occurrence in myelomatous lesions of crystals, which appear either as needles or as rhombic prisms. They lie embedded in fibrous tissue and display at the periphery giant cells, an appearance indicative of absorption. Abrikosov believed that these crystals formed as the result of action of the chondroitin-sulphuric acid developed from destroyed tissue. Because similar crystals could be obtained from the Bence-Jones bodies, he asserted that myeloma is not a primary disease of the bone marrow but a variable structural reaction to an altered intermediary metabolism. The original concept of myeloma as a true neoplasm was replaced by that of a systemic disease of the hematopoietic system related to aleukemias and leukemias. However, the dictum that myeloma is always multiple was in turn contradicted by the recent reports of purely localized myelomas, the clinical features of which bear some resemblance to the localized form of osteitis fibrosa. The solitary myelomas appear to be almost exclusively plasmocytomas. They display a tendency to involve the long bones of the extremities as well as those of the trunk. They appear to be benign and do not give rise to metastases. Rutishauser[8] and Geschickter[9] each reported a case of myeloma of the femur. Mathias[10] reported a case of solitary myeloma of the skull cured by surgical removal of the tumor. Roentgenologic study of his case eighteen months later failed to reveal a recurrence or metastases. There was no anemia, and Bence-Jones bodies were not found in the urine. Walthard's[11] case on postmortem study proved to be a circumscribed plasmocytoma of the third thoracic vertebra. It appears, therefore, that besides the generalized form of myeloma with its hopeless outlook there is a localized form amenable to surgical therapy and offering a favorable prognosis.

1. McIntyre, William: Case of Mollities and Fragilitas Ossium, Medico-Chir. Tr. 33:211, 1850.
2. Bence-Jones: Philosoph. Tr. Roy. Soc. London 1:55, 1848.
3. Dalrymple, John: On the Microscopical Character of Mollities Ossium, Dublin Quart. J. M. Sc. 21:05 (Aug.) 1846.
4. von Rustizky, J.: Multiple Myelome, Deutsche Ztschr. f. Chir. 3:162, 1873.
5. Bozzolo: Rif. med. 6:355, 1897.
6. Kahler: Prag. med. Wchnschr. 14:33, 1889.
7. Abrikosov: Virchows Arch. f. path. Anat. 178:335, 1903.
8. Rutishauser, Erwin: Zur Frage der solitären Myelome, Centralbl. f. allg. Path. u. path. Anat. 58:355 (Oct. 10) 1933.
9. Geschickter, C. F., and Copeland, M. M.: Multiple Myeloma, Arch. Surg. 16:807 (April) 1928.
10. Mathias, Ernst: Zur Myeloma Frage, Beitr. z. klin. Chir. 161:1 (Jan.) 1935.
11. Walthard, B.: Circumscriptes myelogenes Plasmocytom der Wirbelsäule, Schweiz. med. Wchnschr. 54:385 (March 30) 1924.

STAPHYLOCOCCUS TOXOID

The demonstration of the production of highly potent toxins by various strains of staphylococci and the observation that the human blood stream contains measurable amounts of the antitoxin have materially changed the conception of staphylococcic infections. As a direct result of these determinations the possibility of treating chronic staphylococcic infections by means of formaldehyde-treated toxin (toxoid) has arisen. Both favorable and unfavorable results of the clinical use of staphylococcus toxoid have been experienced. On the basis of the available evidence, one brand of this product was recently accepted by the Council on Pharmacy and Chemistry.[1] Two new clinical reports have lately appeared in the *Lancet*.[2] In one of these (Murray) the results are especially susceptible of analysis. Murray treated 116 cases of chronic staphylococcic infection. The patients were from 6 weeks to 82 years of age. In ninety patients, whose stories seemed reliable, the average duration of the disease had been six and one-half years and the longest appeared to be fifty-four years.

The presence and measurability of circulating staphylococcus antitoxin in the blood permits certain objective observations in addition to the clinical course. Thus Murray found that the quantitative difference in circulating antibody between his group of patients before treatment (exclusive of those with osteomyelitis) and 100 normal controls was not apparently significant, with the possible exception of a low titer of antibody in the group having carbuncles. It was further possible to observe the change in circulating antibody resulting from the treatment with toxoid. All the patients in the series had the same first course of injection of toxoid (0.05, 0.1, 0.2 and 0.4 cc. of a product of unstated potency at weekly intervals); the author unfortunately records dosage in fractions of a cubic centimeter rather than in dermonecrotizing units of the toxin from which the toxoid was prepared. The blood was retested one week after the fourth dose. At this time the average amount of staphylococcus antitoxin was approximately eight times the average level found before the beginning of treatment, except in cases of osteomyelitis.

The injection of staphylococcus toxoid produces local swelling and pain, but the number of really severe local reactions has been remarkably small. In order to tabulate the clinical results, Murray divided his cases into acne, blepharitis, furunculosis, carbuncles and the like. Patients were classed as "recovered" if fresh lesions ceased to appear during the course of injections and did not reappear during the six to eight months of subsequent observation. Of the 116 patients, fifty-one recovered, fifty-six were improved and nine received slight or no benefit. The best results were apparently obtained in furunculosis and the least satisfactory in acne. A comparison of the clinical results with the changes in antitoxin titer under treatment indicates that the increase in titer appears to have some prognostic value. It is impossible to predict from the initial titer, however, whether or not the final result will be favorable.

In another paper, Dolman reports the results of treating with toxoid 306 patients suffering from chronic staphylococcic infections. Less susceptible of analysis than Murray's paper, encouraging results are reported. "The acquisition of clinical immunity," he says, "could be correlated with an increased staphylococcus antitoxin titer of the serum." In general, a return of infection occurred only after there had been a considerable fall in the titer of circulating antitoxin. The high antitoxin titer and renewed clinical improvement could usually be restored by further treatment with toxoid.

The administration of staphylococcus toxoid to patients with chronic staphylococcic infections usually produces a rise in the titer of circulating antitoxin. This rise fails to occur by treatment with vaccines—the only other specific method. In the hands of these investigators the rise is associated with a measurable improvement in the chronic localized staphylococcic infection. Failures have been reported,[3] but these, as Dolman[4] has pointed out, occurred chiefly in cases of acne; in addition, the questions of the specificity of the strains of staphylococcus employed in making the toxoid, and the potency of the preparations used, must be considered. To date, the best results have been recorded with recurrent boils and the least successful with acne. The procedure described seems, at least, to warrant careful study with a view to more precise determination of its indications and limitations.

1. Staphylococcus Toxoid, J. A. M. A. 104:562 (Feb. 16) 1935.
2. Murray, D. S.: Staphylococcus Toxoid, Lancet 1:283 (Feb. 9) 1935. Dolman, C. E.: Staphylococcus Toxoid, ibid. 1:306 (Feb. 9) 1935.

COPPER IN HUMAN HEMATOPOIESIS

Recent experimental investigations demonstrating the importance of copper as an essential hematopoietic agent in various laboratory animals have led to speculation regarding the rôle of this element in human blood formation. Many attempts have been made to elucidate this question, usually by studies of the therapeutic activity of copper in diseases involving the blood-forming mechanism or of the actual copper content of human tissues and excretions in health and in disease.

The data obtained in the majority of reports in the literature indicate that copper is without appreciable effect as a therapeutic agent in human anemias. Negative results have been reported on patients with pernicious anemia and with various types of "secondary" anemia. In the nutritional anemia of infancy, how-

3. Kindel, D. J.: Staphylococcus Toxoid in the Treatment of Pustular Dermatoses, J. A. M. A. 102:1257 (April 21) 1934.
4. Dolman, C. E.: Staphylococcus Toxoid in the Treatment of Pustular Dermatoses, Correspondence, J. A. M. A. 102:1600 (May 19) 1934.

ever, some recent evidence[1] seems to show that about one patient in twenty may suffer from copper deficiency and therefore may benefit from copper therapy. Experiments of this type on human patients are carried out with difficulty and further carefully controlled studies employing sufficient numbers of cases must be made before conclusions are drawn.

Direct chemical analyses of various human tissues and excreta have likewise failed to give definite information as to the function of copper in man. Copper is apparently present in significant amounts in many human tissues,[2] and its presence in normal human blood has been demonstrated repeatedly. These observations, while suggestive, offer no direct evidence of the importance of copper in man. Analyses of the blood of patients with anemia, however, have yielded more significant information. The observation has been made[3] and recently confirmed and extended[4] that the copper content of the blood of anemic subjects is above normal. In the latter investigation the average copper content of the blood in a series of fifty healthy adult men and women averaged approximately 132 micrograms per hundred cubic centimeters. The blood of patients with various diseases, however, showed increases well above the normal. In no instance was there a value less than normal.

The diseases that were studied included pernicious anemia, Banti's disease, acute myelogenous leukemia, chronic lymphatic leukemia, malaria, gastric hemorrhage, arsenic poisoning, nephritis, carcinoma, tuberculosis and polycythemia vera. High blood copper was observed also in pregnant women. In the cases of pernicious anemia studied there appeared a relationship between the degree of "hypercupremia," the severity of the anemia, and the amount of iron present in the blood. The relation was inverse, the high blood copper being associated with a low blood iron and, in general, a more severe anemia. The correlation between variations in these constituents was particularly striking in a single case of polycythemia vera treated with phenylhydrazine. The copper content of the blood was normal and the iron content was high before treatment was inaugurated. Simultaneous with the drop in erythrocytes following phenylhydrazine therapy there occurred a decrease in the iron and an increase in the copper of the blood. When treatment was suspended, these values returned to the original levels. The significance of these data is largely a matter of conjecture. The high copper content of the blood in anemic subjects may represent a compensatory response of the organism resulting in a mobilization of this hematopoietic catalyst, thus promoting a restoration of the normal cell and pigment concentration in the blood; or the increase in copper may be a manifestation of an accumulation of this element in the blood as a result of its poor utilization or altered metabolism, a situation somewhat analogous to the hyperglycemia of diabetes mellitus resulting from an impairment of carbohydrate metabolism.

Although the foregoing investigations strengthen the opinion that a deficiency of copper does not exist in adult human subjects and that copper therapy is not indicated in human anemias, except perhaps in occasional cases of nutritional anemia in infants, some support is added to the thesis that a small amount of copper is involved in blood formation in man.

1. Hawksley, J. C.: Copper Therapy in Nutritional Anemia, Proc. Roy. Soc. Med. 27:1055 (March) 1934.
2. Chen, T. F., and Adolph, W. H.: Copper Metabolism in Man, Biochem. J. 30:676 (Feb.) 1936.
3. Gerber, E.: Copper and Anemia, Am. J. Dis. Child. 48:1055 (Nov.) 1934.
4. Sachs, Adolph; Levine, V. E., and Fabian, A. A.: Copper and Iron in Human Blood, Arch. Int. Med. 58:237 (Feb.) 1936.

Current Comment

HORMONES IN THE TREATMENT OF HEMOPHILIA

The limitation of hemophilic manifestations to the male has provided a speculative basis for the theory that some substance peculiar to the female, possibly a hormone, inhibits the appearance of symptoms in girls and women. Some support for this hypothesis was obtained from experiments in which estrogenic substance could not be detected in the urine of hemophilic males whereas small amounts were consistently found in urine from normal males. It seemed possible, therefore, that the estrogenic hormone itself might be involved in producing the immunity of the female sex to this malady, and that the administration of the substance might produce a similar resistance in males afflicted with the disease. Experimental studies of this hypothesis have yielded conflicting results with regard both to the therapeutic efficacy of the estrogenic hormone and to the absence of this substance from the urine of the hemophilic. In a recent study,[1] data on two cases of hemophilia have been reported which clearly show that the administration of the estrogenic substances theelin and theelol was without effect on the rate of coagulation of the blood and that the amounts of estrogenic material excreted in the urine were no less than those found in normal subjects. Further data confirming the latter observation were obtained in another group comprising forty-five patients with hemophilia. Indeed, the average amount present in the urine of the patients was somewhat greater than that of a group of twenty-six normal subjects. Data were also presented in this report which demonstrated that the luteal hormone and an anterior pituitary gonadotropic substance were likewise without effect in the treatment of hemophilia. In view of the impure nature of the preparations of these two hormones now in use, however, it might be well to reserve final judgment regarding their effects until the therapeutic activity of the chemically pure, crystalline hormones themselves has been determined.

1. Chew, W. B.; Stetson, R. P.; Smith, G. V., and Smith, O. W.: Estrogenic, Luteal and Gonadotropic Hormones in Hemophilia, Arch. Int. Med. 58:431 (March) 1936.

Medical Economics

TUBERCULOSIS AND INSURANCE

Tuberculosis, like diphtheria, after attacks by medical science and service for many years has been constantly declining. It is claimed by many workers in this field that universal and thorough application of existing knowledge would practically eliminate these diseases in modern nations just as such an application has already almost ridded these nations of plague and yellow fever that once were as great a threat to human life and health.[1]

Reduction of mortality in tuberculosis depends largely on early and accurate diagnosis followed by prompt and proper treatment. Such a situation, at first sight, seems to offer an excellent opportunity to test the comparative efficiency of medical service. Unfortunately there are many other factors that influence the incidence of tuberculosis and the rate of decline in mortality. Economic conditions, diet, pure milk, housing, overcrowding, occupation, age and race are some of the factors[2] that may be favorable or detrimental influences on both morbidity and mortality.

It is possible that when entire nations are included in comparisons of tuberculosis mortality there may be a tendency for some disturbing factors to "cancel out" and thereby lose some of their importance. This tendency is too uncertain to be

TABLE 1.—*Death Rates for All Forms of Tuberculosis Per Hundred Thousand in Great Britain* *

Year	Rate
1921	111.7
1922	110.7
1923	104.9
1924	103.9
1925	101.7
1926	94.2
1927	94.2
1928	90.9
1929	91.3
1930	87.3
1931	84.9
1932	81.5
1933	79.9

* Annual Report of the Chief Medical Officer of the Ministry of Health on the State of the Public Health, London, 1934, p. 271.

accepted without warning. Such factors have much less importance when the rate of decline in mortality in two or more nations is compared. There was seldom any such change in these factors within a single country as would greatly influence this rate of decline. The important new factor in all the countries considered is the advance in the science, art and application of medical service, and this is exactly the factor that it is desired to measure.

The incidence of tuberculosis varies so closely with income that it has often been called a "poverty disease." The higher prevalence among low-paid workers and urban residents makes tuberculosis mortality an especially good test for the comparison of medical service under insurance with such service in private practice. The principal avowed justification of insurance is that it provides a medical service for the low-wage classes superior to that which they can provide for themselves from private medical practice. If insurance medical practice fails to do this, it forfeits its reason for existence so far as medical care is concerned.

It should also be noted that no country has ever been able to meet the problem of tuberculosis care and treatment through insurance alone. In both Germany and England, with which it is proposed to compare conditions in the United States, there are elaborate and expensive organizations for the purpose of fighting tuberculosis similar to those found in this country. This renders conditions more closely comparable, since the dominant differing feature is the method of organizing and furnishing medical service.

Early and accurate diagnosis is of primary importance in the successful treatment of tuberculosis. It has been constantly urged by advocates of insurance that in private practice the economic obstacle is the principal hindrance to prompt and

TABLE 2.—*Tuberculosis Death Rate Per Hundred Thousand in Registration Area* *

	Respiratory	Other Forms	Total
1920	97.0	17.0	114.0
1925	75.9	16.8	92.7
1929	67.4	8.4	76.0
1930	63.4	8.1	71.5
1931	60.7	7.3	68.2
1932	56.4	6.6	62.8

* Statistical Abstract of the United States, 1934, p. 68.

universal service and that insurance, by removing this obstacle, makes such service available to all the insured.

The one factor peculiar to the United States is the presence of a large Negro population with a high tuberculosis mortality rate.

The mortality rate for all forms of tuberculosis for Great Britain since 1921 is given in table 1.

In twelve years there was a decline of forty-two deaths per hundred thousand, an average annual reduction of 3.5 deaths per hundred thousand and a total decline of 37 per cent.

The corresponding figures for the registration area of the United States are given in table 2.

Public Health Reports[3] gives the rate per hundred thousand for all forms of tuberculosis in twenty-eight states with 95,000,000 population as 56.5 for 1933. Taking the period 1920 to 1932 covered in the table, there is a decline of 51.2 deaths per hundred thousand, or 44.9 per cent in twelve years, an average annual reduction of 4.3 deaths per hundred thousand.

It has not been possible to locate figures for all of Germany comparable to those for England and the United States. The Epidemiological Report of the Health Section of the Secretariat of the League of Nations for September-October 1932 and January and February 1934 gives information from which table 3 was compiled.

Without attempting any mathematical comparisons of the figures in this table, which might lead to the assumption of an accuracy that does not exist, it is evident that from no point of view do these figures indicate that insurance furnishes

TABLE 3.—*Death Rates Per Hundred Thousand for All Forms of Tuberculosis in Various Large Cities*

Cities	1929	1930	1931	1932	1933
Chicago	77	68.9	66.2	57.4	54.4
New York	73	71.1	68.4	62.9	61.6
71 German cities	91	81.3	80.5	74.6	65.6
Berlin	101	91.4	91.4	85.8	87.3
16 Scottish cities	110	102.3	101.8	96.3	94.3
London	109	99.5	102.1	93.5	88.5

* 144 cities from March 25, 1933, and 150 from March 26, 1933, to May 6, 1933, were included.

a medical service that is more effective in the struggle against tuberculosis than is furnished in the United States under private medical practice.

This conclusion is strongly fortified when the mortality rates are given for the various states. It then becomes apparent how great has been the influence of the large Negro population in certain localities and how far in advance of any insurance countries are a number of important states with populations comparable as to industrialization and other features with England or Germany. Such comparisons cannot be pushed too

1. Louis I. Dublin (Health Outlook for 1933 Inspires Optimism, the Diplomatic 71:32 (Jan.) 1933) says: "I believe that tuberculosis will continue to behave according to formula, that is, with every succeeding year we shall observe a reduction in the death rate. We are nearing the end of the fight against tuberculosis. It is destined to be a few years to equal among the other causes of death—and the greatest reduction in mortality has taken place in the most-crowded population, where the situation has always been the gravest."

2. Transactions of the Nineteenth Annual Conference of the National Association for the Prevention of Tuberculosis, July 1913. The meeting was devoted almost exclusively to consideration of environmental factors in relation to tuberculosis.

3. Mortality in Certain States During 1933, with Comparative Data for Recent Years, Pub. Health Rep. 49:559 (May 4) 1934.

far, since it must always be remembered that higher incomes in this country create more favorable conditions for ameliorating or overcoming the ravages of tuberculosis. It is well to note also that taking considerable sums from these incomes to furnish the sort of medical service that is given under insurance might remove some of this advantage now enjoyed by American workers. Keeping these considerations in mind, the mortality rates by states are worthy of study.

Table 4 covers twenty-eight states, within the registration area, with a population of 95,000,000. The figures "are based on a complete review and retabulation of the individual death certificates from each state."

In Germany and England nearly all employees in the wage classes most susceptible to tuberculosis are freely furnished with medical service through insurance. The advocates of insurance charge that in the United States these classes are denied proper medical care by reason of their economic condition. It is especially charged that this economic obstacle prevents early diagnosis of incipient diseases such as tuberculosis. These arguments raise two closely related questions: Is the reason for the failure to obtain medical service wholly, or mainly, economic? Does insurance bring about an early diagnosis of tuberculosis?

TABLE 4.—*Death Rates for Tuberculosis, All Forms Per Hundred Thousand in Twenty-Eight States* *

State	1932	1931	1930	1929	1928
Alabama	77.2	86.3	86.0	85.7	89.6
California	81.0	88.9	98.3	104.3	115.1
Colorado	68.2	82.1	84.8	93.5	99.4
Dis. Columbia	121.5	120.2	114.0	114.6	120.6
Georgia	65.5	72.9	73.4	74.0	82.1
Idaho	28.6	29.0	32.9	42.5	37.4
Illinois	54.1	59.1	59.6	68.8	73.4
Indiana	57.2	57.6	63.6	70.3	76.0
Iowa	30.2	31.5	33.1	32.6	34.9
Kansas	32.5	37.0	34.8	37.5	40.0
Louisiana	72.7	81.5	84.1	86.3	87.7
Maryland	98.2	98.7	98.9	104.6	108.8
Michigan	48.2	53.3	59.8	66.1	67.8
Minnesota	39.5	40.0	44.3	54.5	54.0
Mississippi	62.6	72.1	78.6	74.2	84.6
Missouri	53.0	61.3	62.3	68.7	66.3
Montana	30.8	34.6	34.3	39.9	36.3
New Jersey	68.6	68.1	68.3	73.1	72.9
New York	62.6	64.4	71.0	74.0	82.7
N. Carolina	65.5	68.6	74.7	83.3	78.1
Ohio	54.9	62.0	63.0	69.8	73.3
Pennsylvania	52.5	56.4	59.9	66.1	71.4
S. Carolina	65.5	70.7	76.5	79.1	83.4
S. Dakota	45.1	43.7	51.9	54.7	64.0
Tennessee	94.7	107.2	113.7	120.3	129.6
Virginia	81.0	87.9	85.0	91.4	103.8
W. Virginia	58.4	59.0	62.4	68.0	73.0
Wisconsin	44.0	48.1	48.5	52.3	54.5
Hawaii	94.3	98.3	102.3	110.4	124.0
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	70.1	76.7	81.3	87.3	90.6

* Mortality in Certain States During 1932, with Comparative Data for Recent Years, Pub. Health Rep. 48: 678 (May 5) 1933.

Those who deal with tuberculosis in England are constantly complaining of delay in the detection of the disease. Some quotations from an official report are worthy of note: [4]

> During 1933, 66,351 new cases were added to the notification registers of England and Wales, as compared with 68,792 in 1932. This decline is more or less proportional to that in the mortality of the disease. It would, however, be more satisfactory if the decline became less rapid or ceased, as this would imply that more patients were being notified at an earlier stage, when the prospects of recovery were greater. It is unsatisfactory that, out of the 61,709 new cases of tuberculosis notified to the Medical Officers of Health of England, 2,072, or 3 per cent, came to notice only after death; viz., 2,455 from the local registrars' returns of death and 617 from posthumous notifications. There is reason to believe that this figure is an understatement of the facts, since it is known that some Medical Officers of Health still do not obtain returns of deaths from the local registrars.
>
> Notification in the late stage of the disease is commented upon by many Medical Officers of Health in their annual reports. The Medical Officer of Health of Plymouth states that 50 per cent of patients died from tuberculosis within a year of notification.

There are some antituberculosis workers in England who maintain that insurance is to some extent directly responsible for delay in diagnosis and proper treatment. One such physician [5] imagines an insured sufferer from tuberculosis saying:

> . . . had as it was before the Act was passed for a patient in a similar condition to myself to be already during four or five years, I am not now going to risk the risk of taking my symptoms to and being examined by a medical attendant because he, considering that I am suffering from pulmonary tuberculosis, will bring it about through the operation of the Insurance Act that a certain late shall overtake me; I shall be subjected to application of sanatorium treatment at a stage far earlier than could be detected before 1912; though I am a danger, if enrolled with my approval, to my young children, I must carry on with my work as long as I can, living at home because the Act does not offer me an option to live apart from my children, providing the accommodation, except temporarily in a sanatorium."

It is not at all unlikely that the unfortunate administrators of the Act, from those at the Ministry of Health to the tuberculosis officers and the panel doctors, realize that they have to cope with a Frankenstein monster created when the National Health Insurance Act came into force in 1912. They probably are as well aware as anyone of the unimproved and even worsened outlook under the Act in most parts of England of those who are suffering from pulmonary tuberculosis; but as administrators they are, with some notable and fortunate exceptions, saddled with restrictions; in a few parts only of the country has the crying need for the amelioration of the handicap inflicted on cases of pulmonary tuberculosis been met by the establishment of pulmonary hospitals or institutes, where a considerable number of cases hitherto condemned to undergo sanatorium treatment are now being admitted for more effective and modern treatment.

A German physician [6] recognizes a similar situation and says:

> It is a regrettable fact that pulmonary tuberculosis is seldom promptly recognized in general insurance practice. This is all the more significant since at the present time the outcome of treatment of pulmonary tuberculosis stands and falls with the period of the diagnosis.

The answer to the two questions would seem to be that the principal obstacle to the receipt of medical service at an early stage is not economic but personal and therefore is not removed by insurance.

In this and the preceding articles an attempt has been made to assemble the testimony offered by morbidity and mortality rates as to the comparative efficiency of medical service under insurance and in private practice. These statistics have been assembled to cover the following conditions:

1. Complete morbidity and mortality statistics for entire populations.
2. Morbidity statistics for employees subdivided as to:
   (*a*) Number of illnesses per person per year.
   (*b*) Average duration of illness per person employed.
   (*c*) Average duration of disabling illness among those who have such illnesses.
3. Morbidity and mortality rates for diphtheria.
4. Morbidity and mortality rates for tuberculosis.

Judged by all these tests, such information as is available agrees in support of the conclusion that the service received by the low-income classes is more efficient under private practice in the United States than under insurance in England and Germany, the two most extensive systems of sickness insurance now in existence.

NEW YORK CHANGES COMPENSATION CODE

The long struggle waged by the Medical Society of the State of New York to get rid of some of the abuses in medical care under workmen's compensation has taken a long step forward with the adoption of the O'Brien-Kantowski medical abuses bill by the state legislature.

At the time the bill was signed, Dr. Arthur J. Bedell, president of the state medical society, thanked the governor on behalf of the medical profession of the state and commented as follows:

"This law gives local county medical societies the opportunity to recommend qualified physicians for the various phases of compensation practice. These local groups of doctors will immediately take action to set up machinery to make the law effective.

"For twenty years the old law has encouraged a system of selecting those doctors so that factors other than the character and fitness of the individual physician have been the deciding

4. Annual Report of the Chief Medical Officer of the Ministry of Health, 1933, p. 124.

5. Bingo, M. B.; G. P.'s and T. B.: An Indictment—The Answer, Brit. J. Tuberc. 26: 69 (April) 1934.

6. Abelmann, M.: The Present Recognition of Tuberculosis in Kassenpraxis, Medizinische Welt 8: 982 (July) 1934.

elements in determining the men to be employed. For years the medical profession has tried to obtain legislation to remedy a vicious system which has resulted in conditions little short of disgraceful. The new law will go a great way to cure these evils.

"A new feature of the law will be that five physicians, named by the governor on the recommendation of the state society, are to represent the profession on the labor council, which has the ultimate responsibility for administering the law. This group of doctors will have supervision of all medical phases of the act.

"The medical profession of the state accepts the serious responsibility of naming the doctors who are to practice compensation insurance, with confidence that a marked improvement will be seen in the care which patients receive."

Association News

ANNUAL CONGRESS ON MEDICAL EDUCATION, HOSPITALS AND LICENSURE

Thirty-First Annual Meeting, held in Chicago, Feb. 18 and 19, 1925

(Continued from page 1342.)

DR. ROY B. HARRISON, New Orleans, in the Chair

FEBRUARY 19—MORNING

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE FEDERATION OF STATE MEDICAL BOARDS

SHOULD THE RADIOLOGIST, THE PATHOLOGIST AND THE ANESTHETIST BE LICENSED TO PRACTICE MEDICINE?

Legal Aspects

DR. WILLIAM C. WOODWARD, Chicago: The question is not, as I see it, as to whether roentgenologists and others of the classes named shall be licensed but whether the practice of these particular arts shall be limited to licensed physicians.

If roentgenology or pathology or anesthetization is applied for purposes other than of diagnosis and treatment, I do not believe that under any of the medical practice acts or under the general principles that govern the practice of medicine, it can be said that these arts are a part of the practice of medicine. When they are applied for diagnosis and treatment, in my judgment, they are parts of the practice of medicine. That, however, does not require that they shall be performed solely by licensed practitioners of medicine. There are many functions of a physician that are being entrusted to unlicensed persons. The matter at issue, then, is not only the question as to whether roentgenology, anesthetization and pathology are parts of the practice of medicine but also whether a physician licensed to practice medicine can delegate to an unlicensed person his right to function in any of these fields. As a general rule, a physician may delegate to another the duty of performing some function that calls for no particular professional judgment. It may be the application of a bandage, the instillation of a few drops into the eye to produce local anesthesia, or the administration of a hypodermic. They are purely what are termed administrative matters. But when it comes to the delegation of judgment, that is not a lawful delegation. So in these cases the question comes as to whether roentgenology, pathology and anesthetization as practiced by these unlicensed agents can be practiced without the exercise of substantial medical judgment. If it cannot, then an unlicensed agent is violating the law regulating the practice of medicine. If he does not have to exercise any judgment, the delegation is probably a lawful one. A surgeon practicing in some remote place, meeting with a sudden emergency, may have to submit his patient to anesthetization at the hands of the most ignorant kind of a person. If he doesn't call on that person to aid, the patient will die; the operation cannot be performed. Therefore the circumstances under which a physician undertakes to delegate his right to practice roentgenology or pathology or to administer anesthesia depends not only on the question as to whether the agent to whom authority is delegated has to exercise a professional judgment, so to speak, but whether the circumstances of the case call for a delegation that would not otherwise be permissible. Some roentgenologists have attempted to draw an analogy between surgery and the practice of roentgenology, pointing out that the roentgenologist penetrates the tissues, as they say, by means of the x-rays. The argument is not sound beyond a certain point. It is not sound because a person can consent to have his tissues penetrated by a knife or a needle by an unlicensed person, and that person will not be engaged in the practice of medicine unless the penetration is for the purpose of diagnosis, prevention or treatment. Of course, if the penetration involved calls for any grave risk of life, his own consent would be void, and the person who operated would be liable to a criminal and a civil charge of assault; otherwise the performance would be entirely lawful. So long as the penetration of the tissues by x-rays is not for the purpose of diagnosis and treatment, and as the penetration is done with the consent of the patient or some one lawfully authorized to consent on his part, I can't see that there is any necessity for limiting the performance to licensed practitioners of medicine.

I desire only to lay down a few general principles. It has been said that, because a roentgenologist examines his patient to determine whether he can properly take a roentgenogram, the performance is the practice of medicine and must be undertaken by a licensed physician. With that I am inclined to agree. If one sends a patient to a roentgenologist and asks him to determine whether a roentgenogram should or should not be taken, or what treatment to administer, the dosage and everything of that kind, clearly, I believe, the roentgenologist is practicing medicine; but otherwise it can hardly be said that he is. If one sends the patient to a roentgenologist asking that a roentgenogram be taken and the print be returned without any expression of opinion on the part of the roentgenologist, it is difficult to see where there is any professional judgment called for except on the part of the physician.

Another feature that must be considered is that, if the law is going to limit the practice of roentgenology to licensed physicians, roentgenologists will probably find themselves in the position of being compelled to employ nothing but licensed physicians as their assistants. Another point is as to whether it is possible to demonstrate any definite harm that is being done in the practice of roentgenology by unlicensed persons over and above the harm that is done in the practice of roentgenology by licensed persons who are incompetent. It is not merely a question of regulating the practice of roentgenology as between licensed persons and unlicensed persons, but, after all, what the public wants in the regulation of roentgenology so that incompetents will be excluded. In the matter of pathology, the principles that I have laid down are very similar. It isn't enough to provide that there shall be an adequate plant, equipment and personnel, but some provision must be made whereby inspectors will check up on the work of the laboratories. That, I think, is the only safe rule.

With respect to anesthesia the situation is somewhat different, one that comes more nearly to bringing the practitioners into the practice of medicine, and yet I have failed to find a decision of a court, I have failed to find a statute that forbids an unlicensed person from practicing anesthetization if the person is administering anesthesia under the direction of a licensed physician. In other words, custom has grown up to such an extent that the administration of general anesthetics by unlicensed persons is definitely tolerated. In Arizona it is provided that a registered nurse may administer anesthetics under the direction of and in the presence of a licensed physician, provided the nurse has taken a prescribed course of anesthesia at a hospital in good standing or is a graduate in the science of anesthesia from some recognized school or college. In Ohio it is provided that "nothing in this chapter shall be construed to apply to or prohibit in any way the administration of an anesthetic by a registered nurse under the direction of and in the immediate presence of a licensed physician, provided such nurse has taken a prescribed course in anesthesia

at a hospital in good standing." In Washington it is provided that "nothing in this section shall prevent a registered nurse or trained office assistant from administering an anesthetic under the direct supervision of a licensed dentist." In West Virginia it is provided that "in any case where it is lawful for a duly licensed physician and surgeon practicing medicine and surgery under the laws of this state to administer anesthetics, such anesthetics may lawfully be given and administered by any nurse who has been duly registered as such under the laws of this state, provided such anesthetic is administered in the presence and under the supervision of a licensed physician and surgeon." In Kentucky it is provided that "any person living in this state or who may hereafter come into this state who administers anesthetics except on the prescription of a legally qualified physician or in any way performs the duties usually performed by physicians, without having complied with the provisions of law or opens an office for such purpose, shall be subject to the penalties. . . ." This is a group of states in which the legislatures have definitely authorized the administration of anesthetics by other persons than licensed physicians. The courts have taken a somewhat similar view.

Bearing in mind what I have said, I hope that those who are going to discuss it will consider their subjects from the standpoint not only of practitioners but also of the public and from the standpoint of the unlicensed person who will be excluded from business under any rules that may limit practice to licensed physicians and that they will consider their subjects from the standpoint of hospital work. It is important in asking for corrective legislation to proceed at once to collect evidence that will show not merely that the use of roentgen rays, the use of anesthetics and the practice of pathology by persons who are not licensed in the practice of medicine is bad but that it is worse than the practice of those several arts by physicians who are inadequately trained to practice them. Unless one is prepared to present the facts and figures, he will not get anywhere with a well informed legislative committee.

The Radiologist

Dr. B. R. Kirklin, Rochester, Minn.: There can be but one answer to this question, and that answer is in the affirmative. Moreover, I hold to the opinion that, so far as may be feasible, the practice of radiology should be entrusted only to radiologists who are, or soon will be, diplomates of the American Board of Radiology. Nevertheless, disagreements arise as to how and by whom radiology should be practiced. Considerations of finance underlie most of them, but in the deep background are certain pernicious inheritances from customs of the past. When the x-rays were discovered, potential applications of the new agent to medicine were obvious, but most physicians felt that personal employment of the rays was beneath professional dignity. Consequently, for a long time the making of "x-ray pictures" was delegated chiefly to photographers and amateur electricians. A diagnosis was reached by comparing the general appearance of the "picture" with other "pictures," accepted as representative of normal or abnormal conditions, and the judgment of the lay radiographer was likely to be considered. Thus was founded the notion that radiology is essentially a layman's art, and the belief has not yet been eradicated completely. Because technicians are usually employed and extensive apparatus is necessary, radiology is commonly rated as a laboratory specialty, but laboratories proper deal with specimens, whereas radiology deals directly with patients and really belongs to clinical medicine as a medical specialty. The persistent impression that radiology is necessarily a laboratory branch of medicine fosters the notion that the technical element is dominant.

During the formative period of radiology, when it had not yet found itself, there naturally was a scarcity of well qualified radiologists. Within recent years, however, when it was realized that this branch of medicine had the scope and importance of a specialty, many physicians adopted it as their field, but their qualifications varied widely. Instead of a scarcity, there now seemed to be a surplus, but neither the public nor the medical profession had any means of judging their qualifications. To bring order out of chaos, the national radiologic organizations, acting jointly and with the approval of the American Medical Association, have established the American Board of Radiology, the purpose of which is to elevate radiologic standards by determining the competence of those who profess to be radiologic specialists. Although the board began to function scarcely more than a year ago, it has already certified to the competence of approximately 400 radiologists. The number will be greatly increased when the examinations are completed.

For several years, many of the hospitals have employed radiologists at a fixed salary, or a salary plus a percentage of the receipts from the department, or such percentage only. Of late some of these hospitals have treated the radiologist unfairly by depriving him of a just wage and appropriating substantial profits from the department, thus using it as an important source of income. Dissatisfaction on all sides has become so acute that the entire problem of proper relations between hospitals and radiologists has been brought up for settlement. A plan has been put into effect at Cleveland by which the fiscal affairs of the technical service are separated from those of the professional service. The hospital fixes all charges for the technical work, attends to their collection and pays all expenses of this service. The technical service is supervised by the staff radiologist and he receives compensation from the hospital for that supervision, but as a consultant he is placed on the same footing as other members of the staff, assesses all fees for his service as consultant, and collects them himself. Roentgenographic examinations are made at the order of the radiologist or of the physician in charge of the patient, but only the radiologist or his assistant is permitted to make roentgenoscopic examinations. Interpretations are made by the radiologist when requested by the attending physicians, but the latter has the privilege of making diagnoses without consulting the radiologist.

At first thought the Cleveland plan appears to be plausible, and the sincerity of its sponsors is obvious. Nevertheless it seems to me that the new system not only fails to correct present abuses, but fosters a reversion to those of the past which were worse. The principle that the radiologist, not the hospital, should fix and collect his fees is commendable. But the Cleveland plan separates his just dues into two classes: namely, wages that he earns as supervisor of the technical service, which are collected and paid to him by the hospital, and fees that he earns as a radiologic consultant, which he himself collects. Yet both his wages and his fees are professional earnings, for supervision of the technical service requires professional knowledge and, as supervisor, he is still the hospital's employee, so that his independence is restored only in respect to his fees for consultation. Moreover, in providing for supervision by the radiologist of the technical work, admission is made that the professional and technical services cannot really be separated. This feature of the plan undoubtedly springs from the notion that the radiologist is primarily an artisan, secondarily and by courtesy a physician. But, if the radiologist is double, the surgeon also has a dual personality, that of a skilled workman and that of a physician, and by the same logic he should be able to function in either capacity independently of the other. If the new system were applied to him, the hospital would collect his wages as a workman but require him to collect his fees for professional service. Just how the separation could be made staggers the imagination.

The gravest objection to the new plan arises from the fact that although the staff radiologist is available for consultation, the patient's attending physician, whether qualified or not, is permitted to make diagnoses from roentgenograms, if he so chooses. Certainly under this condition there will be an irresistible tendency to request fewer and fewer opinions from the radiologist with a corresponding reversion to the inefficiency of former days. In explanation and justification of the privilege granted to the attending physician it has been argued that it is necessary to distinguish between minor and major radiology, just as this distinction is made in surgery, whereby any physician may perform minor operations but only qualified surgeons may perform major operations. Minor radiology does not exist. If radiologic examination is indicated at all, its results are always of major significance.

I consider the Cleveland plan in its present form to be a definite step backward. It seems to me that the following plan would be practicable, equitable and efficient:

1. Place the department under the unhampered control and financial management of the staff radiologist.

2. Require that neither examination nor treatment shall be carried out except by or at the order of the staff radiologist or of some other radiologic specialist selected by the patient or his physician and approved by the hospital, or of a specialist deemed by the staff radiologist as competent to make examinations in a particular field. Of late the word "monopoly" has been used in this connection, but it is not clear whether it is complained that the staff radiologist is given a monopoly as against other radiologists or that radiologic specialists are given a monopoly as against all other physicians. If the former is meant, the proviso that any radiologist or any specialist who is qualified to make radiologic diagnoses in his restricted field may use the equipment of the department will dispose of the objection. If it is meant that radiologic specialists as a group are given a monopoly of radiologic work, the answer is that precisely such monopoly is in the best interests of the patient, the general medical profession and the hospital.

3. Insist that after each examination a diagnosis shall be made and recorded by the radiologist or other specialist officiating. Hold the staff radiologist directly or indirectly responsible for every radiologic diagnosis made in the hospital.

4. Separate the finances of the department from those of the hospital, but make the account books accessible to the hospital bookkeeper for inspection and audit. Let the department, not the hospital, collect all bills for radiologic service.

5. Out of the departmental revenues, pay current expenses, give to the hospital a reasonable return on its investment, making due allowance for depreciation, and freely acknowledge the right of the radiologist to whatever surplus remains.

The substitute suggested is not altogether novel and doubtless is susceptible of improvement. No plan can long survive unless it is fair to all concerned, completely restores the radiologist to his rightful status as a physician, and assures the maintenance of a high standard of radiologic service to the patient. Indeed, if the welfare of the patient is given first consideration, a proper solution of the problem will not be exceedingly difficult to find.

The Pathologist

DR. J. P. SIMONDS, Chicago: For the purposes of this discussion, pathologists may be separated into two main groups: (1) those who are engaged only in teaching and research in this field in large universities and (2) those who are concerned with the more practical aspects of pathology as applied to the diagnosis of disease; namely, clinical pathologists and the tissue pathologists who serve hospitals or commercial laboratories. The activities of the first, or professorial, group will have little or no direct effect on the diagnosis of disease or the treatment of patients and it would not seem necessary to require them to possess a license to practice medicine, although they should have an M.D. degree. The second group are concerned with the diagnosis of disease, the results of their work influence the treatment of patients, and, in my opinion, they should have a license to practice medicine.

Two aspects of the subject of this symposium should be differentiated in this discussion: (1) the advisability of requiring by law the licensing of all physicians engaged in the practical application of the principles of pathology to the diagnosis of disease, i. e., all clinical pathologists and those tissue pathologists associated with hospitals, and (2) the advantages to the pathologist himself of the possession of a license to practice medicine. The first aspect of the question might be decided on the basis of a relatively simple principle without the enactment of any new laws. In those states in which the medical practice act specifically makes the diagnosis of disease an essential part of the practice of medicine, the practicing pathologist should be required to have a license to practice medicine, just as the practitioner of any other specialty, for he is practicing medicine under the meaning of the act. It would seem to be unnecessary to urge the passage of new laws to regulate the practice of pathology. Existing laws and the common sense of the pathologist should be sufficient to meet the legal requirements pertaining to this specialty.

It is to the second phase of the question, namely, the advantage to the pathologist himself of a license to practice medicine, that I would direct attention. It is because the pathologist is concerned with the diagnosis of disease and is, or should be, a consultant that he should possess a license to practice medicine before engaging in his specialty. The mere possession of a license will not make him a better pathologist. But with such a license he is on a legal equality with the clinician. The average clinician is inclined to deny the right of a pathologist to his proper position of consultant. The clinician who sees the patient seems to think that the pathologist, who often is not permitted to see the patient, knows little or nothing about disease. As a matter of fact the competent pathologist knows much more about disease than does the clinician. It is his comprehensive knowledge of disease that would make the pathologist a most valuable consultant if given the opportunity. The clinician may also feel that the pathologist knows nothing of the treatment of disease or the care of patients. True, the pathologist is not primarily concerned with treatment. But rational treatment is possible only when the underlying pathologic condition is understood, and the pathologist is especially equipped to aid in obtaining this information. In many cases, perhaps, the most important reason for denying the pathologist his rightful place as a consultant is the principle of reciprocity that is inherent in consultations. The pathologist, not being engaged in clinical practice, is not in a position to reciprocate in the temporary exchange of patients. For these reasons the pathologist, whether he has a license to practice medicine or not, is relegated to the laboratory, is often treated in a patronizing manner by clinicians often his inferiors in the fundamental knowledge of disease, and is denied his proper place as a consultant to the detriment of the highest type of practice of scientific medicine.

Pathology is just as much a medical specialty as is internal medicine, surgery or urology, with as high ideals as any of them. Acquiring proficiency in this branch of medical science is as exacting and as time consuming as in any other specialty. Both the clinical pathologist and the tissue pathologist must of necessity delegate much of the mechanical part of his work to adequately trained and thoroughly supervised technicians. The clinician seems to forget that he too delegates much of his work to others. The clinical history is usually written by an intern. The physical examination is made by an intern or a resident. The practicing physician is aware that the work of these subordinates is of value only as it is done under his supervision and is confirmed, corrected and interpreted by himself. It is even more true that laboratory work done by technicians with little or no medical training is of value in diagnosis only when it is done under the immediate supervision of a trained pathologist. There are few things that are more conducive to careless methods of medical practice than the indiscriminate employment of technicians by clinicians who are capable neither of judging the qualifications of technicians nor of adequately supervising their work.

The pathologist is an indispensable factor in the practice of modern medicine. The clinical pathologist is concerned with the chemical changes in body fluids and excretions; the tissue pathologist with structural changes in the tissues and organs of the body, including the blood. Both are especially concerned with the fundamental changes that underlie symptoms, physical signs and other manifestations of disease. The pathologist actually has a keener sense and a more comprehensive knowledge of the significance of symptoms and physical signs than does the clinician. He is especially prepared to interpret symptoms, physical signs and results of laboratory tests in terms of pathologic structural changes.

Years ago a committee of the American Medical Association drew up regulations with which clinical laboratories must comply in order to receive recognition by the Association. One of the most important of these regulations requires that to be recognized as a specialist a pathologist "must be a graduate in medicine, must have satisfactory training in pathology, chemistry and other allied subjects for at least three years

subsequent to graduation, who is in good standing and has been duly licensed to practice medicine." These regulations doubtless work a hardship on small hospitals. I venture to offer a suggestion for the amelioration of this hardship. The first requisite will be the admission of pathologists to their rightful position as consultants in their specialty. Unless assured that proper recognition will be given them, capable young graduates will not go into this specialty.

Most towns of 5,000 population have a hospital to which all the physicians in the community and neighboring smaller towns are permitted to bring patients and treat them. Such institutions need a capable pathologist even more, perhaps, than larger hospitals of higher grade. In spite of numerous important services which a pathologist could render, the superintendents of such small hospitals feel that they cannot afford a pathologist and the members of the staff must depend on the unsupervised activities of technicians for all laboratory work and are never able to check their clinical diagnoses by postmortem examinations performed by a competent pathologist. Such a deplorable state of affairs could be remedied by suitable recognition of the status of the pathologist as a specialist and consultant, and by a comprehensive plan of cooperation between the hospital and the local physicians. The laboratory of the hospital could be made the center of all laboratory work of the members of the medical profession of the entire community. Under such conditions a financial arrangement could be made that would be satisfactory to the hospital and to the pathologist.

The pathologist of every hospital and commercial laboratory should have a license to practice medicine because (1) he is practicing medicine just as much as any other specialist, (2) it will place him on a legal equality with all licensed clinicians and specialists, and (3) it will insure him certain legal rights and privileges and the opportunity to perform certain professional duties such as qualifying as an expert witness, which only a license to practice can supply. The enactment of new laws appears to be unnecessary.

The Anesthetist

Dr. F. H. McMechan, Rocky River, Ohio: The code of medical ethics has come to me, representing the third generation of Ohio doctors in my family, as a sacred heritage, and an experience of thirty years in anesthesia has convinced me that anesthesia must be limited to licensed and qualified physicians to achieve its destiny—the conquest of human pain.

Anesthesia was the gift of pioneer doctors and dentists to suffering humanity, and every significant advance in its science and practice has been contributed by doctors, dentists and research workers of similar standing. In contrast, technicians have added nothing of any consequence. Anesthetics are among the most potent and dangerous drugs used in the practice of medicine; they penetrate to every cell and organ of the body and may cause almost instant or delayed death by their toxic effects. The dosage of general inhalation anesthetics cannot be prescribed in advance but must be determined from moment to moment during administration. The dosage of local and other anesthetics must be determined by the risk of the patient, the nature and duration of the operation to be done—certainly a challenge to the knowledge and experience of the keenest doctor. No patient should ever be given an anesthetic whose condition and risk has not been diagnosed in advance of the operation, so that every resource of medical science can be used to lessen the risk and make the recovery more assuring. Certainly in this preoperative evaluation and the selection of the safest anesthetic and best method of administration, the medical anesthetist is more in a position to act as a consultant than a technician.

By charting the pulse, respiration, blood pressure and all other available reactions of the patient, the medical anesthetist continuously diagnoses the changing condition of the patient to regulate the anesthetic, to warn of any impending dangers and to combat complications. The surgeon is not in a position to do this for himself or the technician while operating, and the technician is certainly not capable of doing it. The safety first rules of the International Anesthesia Research Society require such diagnostic evaluation and charting by all medical anesthetists to prevent needless deaths.

The safety of the patient demands that the anesthetist be able to treat every complication that may arise from the anesthetic itself by the use of methods of treatment that may be indicated. The medical anesthetist can do this, the technician cannot. More recent developments have extended the field of medical anesthesia to include resuscitation, oxygen therapy and therapeutic nerve block for intractable pain, the treatment of various conditions of disease and the rehabilitation of the disabled—all fields of practice quite beyond the capacity of the technician.

The code of medical ethics of the British Empire removes any doctor from the medical register who uses any one but a doctor to give an anesthetic or who gives an anesthetic for any one but a registered doctor. Also the greatest medical organizations in the British Empire have recognized anesthesia as a specialty of medicine, by maintaining sections of anesthesia for many years. As a result every medical school, teaching and voluntary hospital and nursing home in the British Empire and its dominions has its full quota of exceedingly competent medical anesthetists, all of whom must face a coroner's inquest for every death under anesthesia. Great Britain tried out technician anesthesia just once during the war emergency on account of the tremendous shortage of doctors, but the Society of Coroners discontinued technician anesthesia at the close of the war as too dangerous to public safety in times of peace.

For years organized medical anesthesia in the United States has been as nation wide and progressive as in the British Empire and has now reached the point of the certification of medical anesthetists as specialists and the founding of a college of anesthetists. Minimum standards for approved medical schools require basic science, didactic and clinical teaching and experience in anesthesia. Minimum standards for approved hospitals require that a qualified medical anesthetist must be in charge of the department of anesthesia and maintain that anesthesia is a medical specialty. Although medical anesthesia has reached such a point of achievement that anesthetists from all parts of the world now come to the medical anesthetists of the United States for the latest advances in the specialty, the more extended and rapid development of anesthesia within the profession can be fostered only through medical and not through technician anesthesia.

In those medical schools, teaching hospitals and clinics in which technician anesthesia has been in use, only certain limited routine methods have been entrusted to technicians, all other methods being restricted to surgical specialists or medical anesthetists, plainly an indication that technician anesthesia cannot possibly deliver a complete anesthesia service. Legally even such technician anesthesia must be "supervised" by the operator. Certain medical schools and hospitals are maintaining technician anesthesia schools on the basis of technician teaching and competence. In doing this is not the profession again creating the same sort of "diploma mills" in the practice of medicine that it has spent so many years in abolishing? While the medical anesthetist, practicing as a specialist, is personally legally responsible for negligence, accidents or fatalities under his administration and during recovery, "supervised" technician anesthesia makes either the surgeon or the hospital or both legally liable for damage suits in the same circumstances. Such damage suits are becoming more and more numerous and damages have been awarded in most of them.

The medical profession has the protection of court decisions holding that the license to practice is a "property right" under the constitution. Is the profession prepared to sacrifice this protection by delegating the disposal of this "property right" to the "supervised" or "corporation" practice of medicine? "Supervised" technician anesthesia is the first big inroad of socialized medicine on the economic level of technician pay and standards. It also means the "corporation" practice of medicine by hospitals and hospital associations under layman control. This is shown in the fact that the recently formed association of technicians was founded by one of the largest hospital associations and the member technicians are known as "hospital anesthetists," indicating absolutely "socialized" practice and "corporation" domination. If the "property right" to practice medicine is not upheld as interpreted by West Vir-

gists, Indiana and California and safeguarded by the profession, the socialization and corporation practice of radiology, pathology and anesthesia will be the future fate staring all other specialists, including surgeons, in the face.

Pressure from hospitals and hospital associations has induced the profession to use the technician in limiting opportunities in many lines of medical practice. This is forcing more and more doctors to go into the surgical specialties to make a living. Further overcrowding and technician invasion will inevitably destroy surgery itself economically. The economic factor responsible for 25,000 too many doctors is the fact that 25,000 technicians are practicing "socialized" and "corporation" medicine.

Surveys have shown that 50 per cent of three year trained nurses disappear entirely from nursing within two years after graduation and 85 per cent within five years. This involves a labor turnover and replacement that would economically wreck the greatest industries in the United States and it accounts in great measure for a large share of the annihilating overhead and deficits of the present hospital system. The technician in anesthesia is a part and parcel of this vanishing personnel and represents an economic liability. By contrast the physician devotes a lifetime's career to developing himself, hospital anesthesia service and cooperation in the advancement of the surgical specialties. He is one of the hospital's most permanent economic assets. Millions of anesthetics must be given every year. If any great industry had such a staple product as painless surgery, it would certainly use the best obtainable experts in marketing such a boon to suffering humanity. I leave it to your judgment whether the greatest number of satisfied patients can be made through "supervised" and "corporation" technician anesthesia or through licensed and highly qualified medical anesthetists.

The Surgeon

DR. KARL A. MEYER, Chicago: No surgeon who is worth his salt as a surgeon can be an expert radiologist and an expert pathologist also and at the same time administer his own anesthetics. Of the radiologist he must ask technical perfection in the management of x-rays, fluoroscopies and roentgen therapy, and a penetrating analysis in the interpretation of roentgenologic results. A well trained technician can usually take excellent roentgenograms as long as the pictures do not deviate from the standard routine.

Several recent advances in roentgenography depend on the parenteral injection of contrast mediums. This should not be entrusted to any one but a licensed physician, who would understand the action of drugs and the reaction of patients and be able to act promptly in any emergency. The surgeon would then have to do these injections himself. This would not only tie him up in his work considerably but, unless the organ in question was the surgeon's special field, it is probable that his handling of the injection would be less skilled than that of the competent general radiologist.

Fluoroscopies are certainly outside the province of a technician. The incidence and location of lesions, their usual progress and spread, the movements of the heart and lungs, the physiology of the gastro-intestinal tract, the space relations within the body and deviations from the normal are far outside his ken, unless he knows anatomy, physiology and pathology, and, if he does, then he is a doctor and not a technician. The surgeon, who is primarily a therapeutist, can rarely develop more than a cursory knowledge of fluoroscopy even in special fields, and in any case must always have available some one on whose radiologic ability in other fields he can depend.

Roentgen therapy cannot be entrusted to a technician. The treatment of neoplasms for example requires a fine balance of judgment between effective dosage to stop the growth and limits of tissue tolerance to prevent violent local and general reaction. It requires a profound understanding of the pathogenesis of lesions and a wide experience in their sensitivity. These attributes can be found only in a man with medical training.

The greatest need which the surgeon has of the radiologist is in the field of diagnosis. For the major portion of questionable borderline and unusual cases, the cases in which x-rays are really needed, the surgeon must have the cooperation of an expert radiologist. Roentgenography is not photography. Only a physician practicing radiology would know where the normal suture lines are, where skull fractures are most likely to occur, and that the fracture line might not be visible for ten days after a head trauma. Only such a man could differentiate between osteomyelitis and early or unusual sarcomas of bone, could evaluate properly the amount of normal fibrosis in a lung or the width of an arteriosclerotic aorta, or could manipulate a patient to fill lung cavities with iodized oil or gastro-intestinal diverticula with barium sulphate. Were radiology left to men without a complete medical training, research in this field would stop. Progress depends not on technical perfections but on intimate correlations between the roentgenograms and the patient, which can be discerned only by one trained in handling both.

The practice of pathology should also, from the point of view of the surgeon, be limited to those licensed to practice medicine. The surgeon cannot possibly keep up with the literature and changes in all these fields and must have some one on whom he can rely. The performance of autopsies is vital to the prevention of repeated mistakes in surgery. This cannot be left to a technician; the interpretation of autopsies requires a high grade intellectual activity and experience which is impossible to attain by any one who has not had a complete medical education. The surgeon himself could not and, if he could, should not perform these autopsies, because, even if he wears rubber gloves, cadaver contamination is so difficult to avoid and so difficult to get rid of that it is unjust to his patients for him to persist himself to do autopsies. It would take almost three days to resterilize his hands after such a contact. Therefore he has no right to engage in autopsies.

Anesthesia stands in a somewhat different relation to the surgeon than does radiology or pathology. The research work in the development and perfection of anesthetics and the institution of the unusual or difficult anesthesias must be left to the physiologic, pharmacologic, anatomic and surgical fields of medicine. The actual administration of the ordinary anesthetics, however, is not a highly skilled interpretative science like radiology or pathology, but a relatively uncomplicated, though highly skilled, technical procedure. It would perhaps be ideal to have all anesthetics administered by medical men. Difficulties stand in the way. Administering an anesthetic takes even more time than the surgery. The patient would therefore have to pay an anesthetic fee comparable to the surgical fee. Under present economic circumstances the medical men who go into the administration of anesthetics do so (with certain brilliant exceptions) either as a temporary expedient or because they cannot get into anything else. I venture to say that under these circumstances a conscientious technician devoting a lifetime to the field would probably serve better for the routine anesthetics than a medical dilletante in anesthesia. The surgeon cannot always be with the radiologist or the pathologist. In his work he is constantly with the anesthetist, assumes full responsibility for the anesthesia, can institute the special spinal and intratracheal anesthesias himself and can closely supervise the conduct of the anesthesia throughout its course. For these reasons, from the standpoint of the surgeon, anesthesias can be administered by well trained technicians; but radiology and pathology must be limited to those licensed to practice medicine.

The Internist

DR. JAMES S. MCLESTER, Birmingham, Ala.: The internist is a general practitioner among specialists. He is the one physician who examines the patient as a whole. He it is who pieces together the parts contributed by the several specialists, considers each feature, gives it proper place and emphasis, and then endeavors to envisage the whole. Of great importance to him is the work of the radiologist and the pathologist. He may not be entitled to an opinion regarding the anesthetist, but of the qualifications of these two he can speak his mind freely.

In the last analysis this is a question of education, not merely one of licensure. The license is simply a certification by the state that the holder has been examined and found to have the educational and other qualifications necessary for the practice of medicine. The question, then, is: Shall the educational qualifications demanded of the physician in practice be required also

of those who would limit their work to radiology and pathology? Believing in the profound influence of education on a person's ability to observe accurately and to reason soundly, I answer Yes.

The practice of radiology involves three things: (1) the making of roentgenograms, (2) the description and interpretation of what is seen in the roentgenogram and in the fluoroscope, and (3) treatment by means of radiation. The first of these can be dismissed from this discussion; if that were all, radiology could be practiced by any well drilled technician, no matter what his education. For the other two functions of the radiologist the demands are entirely different. For the interpretations expected of the radiologist, a broad educational background is required. He should have a knowledge of anatomy and physiology and, equally important, a good conception of the diseases of which he would give a roentgenographic description. It is not asked that he make the diagnosis. True, he sometimes, without adequate description, does this, but that is not what is asked. It is requested of him that he observe accurately, describe faithfully what he sees and then in suitable instances, as one feature of the clinical picture, offer his own interpretation. This demands an intimate knowledge of clinical problems. The other part of his work, the application of radiotherapy, demands greater judgment than is required in any other field of therapeutics. The type of treatment needed, the bodily areas to be exposed, the length and frequency of each exposure and the dosage, are best determined after mature judgment, the kind of judgment that comes of a well trained intellect. Without this, irreparable harm may be done. To have the special knowledge required and the ability to bring to bear on the task the proper judgment, the radiotherapeutist should enjoy a type of learning and an intellectual background that come only from a broad, well rounded medical education. As for the pathologist, is there any reason why his education should be more restricted than that of other physicians? No one will deny that the pathologist should be broadly educated.

There is another light in which the educational qualifications of both radiologist and pathologist should be viewed; that is, the light of research. If the rapid advances made in medicine during the last few decades are to progress at full speed, the contributions of radiology and pathology must continue, and these can come as a rule only from men of broad caliber. Medical licensure was devised by the state to protect the public from the incompetent practitioner. Is the radiologist or the pathologist, when incompetent, capable of harm? Yes. This being true, the state should properly require of the radiologist and the pathologist a certificate of competence. This certificate is called a license.

(To be continued)

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time (May 2 and May 9, 4:30 Chicago daylight saving time, 3:30 central standard time). The next three broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

April 25. May Day or All Year 'Round?
May 2. Bring Your Age.
May 9. Saving Our Mothers.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time (May 7, 4 o'clock Chicago daylight saving time, 3 o'clock central standard time). The next three broadcasts will be as follows:

April 22. Sudden Death, Morris Fishbein, M.D.
April 29. Child Health, W. W. Bauer, M.D.
May 7. Mothers of America, W. W. Bauer, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Bill Introduced.—A. 2491 proposes to regulate the conduct of pounds and to regulate the disposition of animals impounded or sheltered therein. This bill specifically makes it unlawful for any pound master to permit any live animal in his custody to be used for experimental purposes or to turn over any animal in his custody to any person, school, university research laboratory or experimental station to be used for educational demonstration or medical, scientific or experimental purposes.

Society News.—Speakers before the Alameda County Medical Association, March 18, included Drs. Edward H. Ryneerson, Rochester, Minn., on "Recent Concept and Treatment of Diabetes."——Dr. Esmond R. Long, Philadelphia, among others, addressed the California Tuberculosis Association in Long Beach, March 29-30; his subject was "The Chemistry of the Tubercle Bacillus." Dr. Long was the principal speaker at the annual banquet; he talked on "Tuberculin in the Epidemiology, Diagnosis and Treatment of Tuberculosis."

Dr. Anrep Gives Lane Lectures.—Dr. Gleb V. Anrep, professor of physiology, Egyptian University Medical Faculty, Cairo, Egypt, will deliver the twenty-fifth course of Lane Medical Lectures, April 22-26, in Lane Hall, Stanford University School of Medicine, San Francisco. The titles of Dr. Anrep's lectures are:

The Proprioceptive Mechanism of Cardiovascular Regulation.
The Central and Reflex Respiratory Regulation of the Heart Rate.
The Coronary Circulation.
The Circulation in the Voluntary and Plain Muscles in Relation to Their Activity.

Resolutions on Communicable Disease.—At a special meeting, April 4, the advisory committee to the San Francisco department of public health on acute anterior poliomyelitis adopted resolutions declaring its attitude on the use of poliomyelitis vaccine and on other types of immunization. The committee urged the director of public health, Dr. Jacob C. Geiger, to take no active stand favoring the use of vaccine for poliomyelitis until its value has been more fully demonstrated. It was recommended that experimental administration be restricted to properly qualified research institutions. Scarlet fever immunization should not be approved, the committee advised, even though the disease is becoming more endemic in the city and county. With respect to diphtheria it was recommended that children be immunized at the age of 1 year, and it was further pointed out that this procedure was the responsibility of the physician in charge of the infant at the time. Members of the committee include Karl F. Meyer, Ph.D., and Drs. William P. Lucas, Edward B. Shaw, Harold K. Faber, James W. Ward and Isaac W. Thorne.

COLORADO

Joint Tuberculosis Meeting.—The Colorado Tuberculosis Association, the El Paso County Sanatorium Association, the Denver Tuberculosis Society and the Denver Sanatorium Association held a combined meeting in Denver, April 4. Speakers included Drs. Oscar S. Levin on "Causes of Death in Surgical Collapse of the Lung"; Charles H. Boisevain, Colorado Springs, "Antibody Response to Different Derived Proteins of the Tubercle Bacillus"; Harry J. Corper, Arthur P. Dunerow and Maurice L. Cohn, Ph.D., "Recent Researches on Immunity to Tuberculosis." Dr. Esmond R. Long, director of the laboratory, Henry Phipps Institute, Philadelphia, gave an address entitled "Taking the Course in Tuberculosis."

Society News.—Dr. Cyrus W. Anderson, Denver, presented a paper on "Physiology and Fertilization of the Human Female," before the Northeast Colorado Medical Society, February 17, in Sterling.——At a meeting of the Pueblo County Medical Society, February 19, Dr. Solomon W. Schaefer, Colorado Springs, discussed problems in tuberculosis, and Dr. William F. Singer, Pueblo, treatment of infections.——The San Juan Medical Society was addressed in Durango, January 13, by Dr. Emil E. Johnson, Cortez.——A symposium on cancer in the intestinal tract was presented before the San Luis Valley Medical Association, February 22, by Drs. Royal H. Finney, George A. Unden, Fred M. Ireland and Carl W. Maynard, Pueblo.——At a meeting of the Medical Society of the City and County of Denver, March 10, Drs. Alfred R. Mosher,

Wheat Ridge, discussed "Value of the Red Cell Sedimentation Test with Special Reference to Tuberculosis," and James R. Jaggy, "Intercranial Injection of Air for Treatment of Head Injuries."

DISTRICT OF COLUMBIA

Medical Bills in Congress.—H. R. 7295, introduced by Representative Quinn, Pennsylvania, proposes to prohibit experiments on living dogs in the District of Columbia for any purpose other than the healing or curing of the dog. S. 2013 has passed the Senate, directing the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to practice the healing art to Dr. Pak Chee Chan.

Annual Scientific Meeting.—The annual scientific assembly of the Medical Society of the District of Columbia will be held May 1-2. Out of town speakers will include Drs. John Shelton Horsley, Richmond, Va., on "The Incidence, Diagnosis and Treatment of Cancer of the Stomach," and Soma Weiss, Boston, on "Syncope." Other physicians on the program will be:

Jerome F. Crowley, Endocrinology.
Frank J. Sladen, Management of the Syphilitic Patient.
William E. Harbaugh, Laryngectomee Rehabilitation, with Special Reference to Elocution of the Patient.
Fred S. Pendell, Removal of Acute Appendicitis in Washington Hospitals for a Period of Two Years.
William H. Wilmer, Diagnosis and Treatment of Ocular Tuberculosis.
John R. Lyons, Abdominal Symptoms in Diabetic Mellitus.
Francis R. Hagner, Profile of Pregnancy.
Howard F. Kane, subject not announced.
John Minor, The Systematic Diagnosis of Anemias.
Stuart O. Foster, The Present Status of the Treatment of Secondary Anemia.
Bernard W. Leonard, The Size and Shape of the Heart.
George R. Hoffman, Erythremia, with Emphasis on Treatment.
John A. Talbot, Fractures.
Edwin Kirby Smith, Factors in the Care of Premature Infants.
Maurice B. Visscher, Myasthenia Gravis and the Myasthenias.
Arthur M. Fishbein, Clinical versus X-Ray Diagnosis of Sinusitis.
Ralph Elliot Rathbone, Treatment of Chronic Sinus Disease with Roentgen Rays.

In addition, physicians participating in clinics include Drs. William Ross Morris, James A. Cahill Jr., Charles Stanley White, Joseph P. Shearer and Harry Hyland Kerr, Charles F. Cake, Sara E. Branham, Walter K. Myers, Ella M. A. Enlows and Eugene Clarence Rice Jr. A complimentary luncheon will be held at the Mayflower Hotel, with Edmund A. Walsh, S.J., as the guest speaker; he will discuss "Soviet Medicine." Dr. George C. Rublaud, district health officer, will address a public meeting Wednesday evening, and the annual banquet will be held Thursday evening. Motion pictures will be shown continuously.

FLORIDA

Bill Introduced.—S. 2 proposes to provide for a system for compensating workmen for injuries arising out of and in the course of their employments and for such diseases or infections as naturally or unavoidably result from such industrial injuries. The employer is to furnish medical, surgical and other remedial treatment, nursing and hospital service, medicine, crutches and apparatus for such period as the nature of the injury or the process of recovery may require. Only in the event that the employer fails to furnish these services, after request by the workman, is the workman to be allowed the privilege of selecting his own physician.

ILLINOIS

Bill Introduced.—S. 257 proposes to require all persons licensed to practice any form of the healing art to register annually with the director of registration and education and to pay an annual renewal fee of $1.

Scarlet Fever Prevalence.—With more than 12,000 cases of scarlet fever and 175 deaths reported since the first of the year, the state department of health announces the greatest wave of scarlet fever and sore throat ever recorded in the state. It was said that about 200 new cases are being reported daily.

Society News.—Dr. Don C. Sutton, Chicago, addressed the Peoria City Medical Society, April 2, on "Heart Disease Complicated by Pregnancy."——Dr. Ralph A. Kinsella, St. Louis, discussed "Streptococcal Infection" before the St. Clair County Medical Society in East St. Louis, April 4.——A symposium on obstetrics was conducted before the Adams County Medical Society, Quincy, April 8, by Drs. Ralph McReynolds, Henry J. Jurgens, Clarence A. Wells, Milton E. Bitter and Norbert A. Blickhan, Quincy.

Chicago

Personal.—Eugene R. Schwartz, superintendent of registration for the state department of registration and education, died, April 10, of complications that followed an operation for gallstones, according to the Chicago Tribune.——Dr. Lowell T. Coggeshall, instructor in medicine, University of Chicago, has been appointed a member of the International Health Division of the Rockefeller Foundation, effective in July.

Study of Premature Births.—The Chicago Health Department made a study of the death certificates of infants born and dying in hospitals having more than 200 births a year, which shows that the death rate of premature infants under 15 days of age was as low as 5 per thousand births in some institutions and as high as 50 per thousand births in others. The low death rate in some hospitals was attributed to three requirements:

1. The new-born infant is conveniently protected against chilling from the moment of birth. Incubator facilities maintained at a proper temperature are constantly available for these infants, and weak infants are not called or bathed until this seems safe.

2. Attendants are trained in proper methods for resuscitation. Small catheters and oxygen are always available. Undue trauma is avoided.

3. Every effort is made to obtain breast milk until the mother's milk is available, and an effort is made to stimulate the mother's breast by manual expression.

Hospitals in which the death rates are high from prematurity are found to be failing in one or more of these essentials. To help meet this problem, the department of health has established a twenty-four hour incubator ambulance service for hospitals that do not have incubator facilities and for private physicians delivering mothers in the home.

INDIANA

Personal.—Dr. Eugene F. Kratzer, Kokomo, was presented with a quilt at a dinner in his honor, February 27, to observe his completion of twenty-five years' practice in the community. The quilt bears the embroidered names of many children whose births the physician attended.——Dr. Floyd L. Grandstaff, Decatur, was named health officer of Adams County, March 5, succeeding the late Dr. John W. Vinard.

Pediatricians Organize.—The Indiana Pediatric Society was organized at a meeting in Indianapolis, March 13. Officers elected are Drs. Louis H. Segar, clinical professor of pediatrics, Indiana University School of Medicine, Indianapolis, as president; Reuben A. Craig, Kokomo, vice president, and Matthew Winters, associate professor of pediatrics at the university, secretary.

Society News.—Dr. Charles O. McCormick, Indianapolis, addressed the Hamilton County Medical Society in Carmel, March 12, on "Maternal Mortality."——The Hancock County Medical Society heard Dr. C. O. Richey, Indianapolis, discuss "Respiratory Disturbances" at a meeting in Greenfield, March 18.——At a meeting of the Tippecanoe County Medical Society in Lafayette, March 14, Dr. Walter Dean, Louisville, Ky., spoke on the eye, ear, nose and throat.——Dr. William E. Bennett, Logansport, discussed "Circulatory Failure" before the Henry County Medical Society in Newcastle, March 14.——Dr. Edmund M. Van Benskirk, Fort Wayne, was elected president of the Indiana Roentgen Ray Society in Indianapolis, February 26.

IOWA

Bill Enacted.—S. 20 has become a law, requiring all applicants for licenses to practice any form of the healing art as a condition precedent to their right to examination by their respective professional boards, to pass examinations in anatomy, physiology, chemistry, pathology, bacteriology and hygiene, to be given by an impartial basic science board.

Society News.—Dr. George V. I. Brown, Milwaukee, will address the Linn County Medical Society, Cedar Rapids, May 2, on "Plastic Surgery, the Child of General Surgery."——A symposium on acute infectious diseases was presented before the Des Moines Academy of Medicine and the Polk County Medical Society, March 26, by Drs. Harold J. McCoy, Arnold M. Smythe, Herman J. Smith and Harold C. Bone.——Dr. Jennings C. Litzenberg, Minneapolis, addressed the Johnson County Medical Society in Iowa City, April 3, on "Toxemias of Pregnancy."

Tuberculosis and Heart Associations Meet.—The annual meeting of the Iowa Tuberculosis and Iowa Heart associations was held at the Hotel Fort Des Moines, March 22, in Des Moines. Symposiums made up the greater part of the program. At a luncheon meeting the speakers were Drs. Walter L. Bierring, Des Moines, President, American Medical Association, and George E. Fahr, professor of medicine, University of Minnesota School of Medicine. Dr. Fahr's subject was "A Clinical Evaluation of the New Cardiology." Dr. William W. Bauer, Chicago, addressed the annual dinner on "The Bird with a White Breast."

KANSAS

Porter Lectures.—Edward A. Doisy, Ph.D., professor of biochemistry, St. Louis University School of Medicine, St. Louis, will deliver the Porter Lectures of the University of Kansas, April 23-24. The titles of the lectures are:

The Ovarian Follicular Hormone and Related Compounds.
Sex Hormone Therapy from the Experimental Viewpoint.
Some Aspects of the Study of Internal Secretions.

The first two lectures will be given in Kansas City and the last at the main university in Lawrence. The annual series of graduate clinics has been arranged for April 22-24 to enable practicing physicians of Kansas and adjoining states to attend Dr. Doisy's lectures.

LOUISIANA

State Medical Meeting in New Orleans.—The fifty-sixth annual meeting of the Louisiana State Medical Society will be held in New Orleans, April 29-May 1, with headquarters at the Roosevelt Hotel and under the presidency of Dr. Chaille Jamison, New Orleans. Dr. Stanhope Bayne-Jones, dean, Yale University School of Medicine, New Haven, will deliver the annual oration on "The Influence of the State on Medical Education." A public meeting, Monday evening, will be addressed by Drs. Frederic J. Mayer, Opelousas, on "The Louisiana System of Public Hygienic Education"; Thomas J. Perkins, Shreveport, "Importance of Mental Hygiene to the General Practitioner"; Robert W. Todd, New Orleans, "Effectiveness of Typhoid Vaccine in the Control of Typhoid Fever"; William H. Perkins, New Orleans, "Who is to Blame for Cancer Deaths," and John Signorelli, New Orleans, "Toxoid Immunization: The New Orleans Campaign for Diphtheria Eradication." Other physicians on the program include:

Lionel J. Bienvenu, Opelousas, Calculus and Pseudo Calculus Disease.
Joseph M. Perret, New Orleans, Tularemia.
Harris Hanes, New Orleans, The Bacteriophage in Respiratory Disease.
Edmund McC. Connely, New Orleans, Uses of Hypnosis in Psychotherapy.
William B. Mathews, Shreveport, Pathology of Sickle-Cell Anemia, with Brief Clinical Considerations.
William H. Provensen, Shreveport, Common Manifestations of Gastro-Intestinal Food Allergy.
Louis J. Dubos, New Orleans, Digitalization in Cardiac Failure.
H. Guy Richo, Baton Rouge, Heart Disease in Middle Life.
Charles J. Bloom, New Orleans, Autogenous Vaccine Therapy in Pyelitis.
Herbert R. Unsworth, New Orleans, Dementia Praecox.
Urban Maes, New Orleans, Pathologist's Part in Malignant Disease from the Surgeon's Point of View.
Donovan C. Browne, New Orleans, Early Diagnosis of Carcinoma of the Colon and Rectum.
Roy Carl Yeager, Covington, Chronic Epidemic Encephalitis: Report of Eleven Cases with Alcoholism as Outstanding Symptom.
Charles A. Thomas, Tucson, Ariz., The Colleges Program of Advanced Pulmonary Tuberculosis.
Curtis H. Tyrone, New Orleans, Vaginal Hysterectomy.

MAINE

Bills Enacted.—The following bills have become laws: S. 714, amending the chiropractic practice act by (1) requiring applicants for licenses to be graduates of chiropractic colleges which, as a condition precedent to their graduation, require personal attendance and completion of a course of four school years of not less than six months each and a total of 2,600 sixty minute school hours and by (2) requiring licentiates to register annually with the board and to pay an annual fee of $3; and H. 1838, limiting the sale of sanitary or prophylactic rubber or other articles for the prevention of venereal diseases, to licentiates of the state bureau of health.

MISSISSIPPI

Lectures on Obstetrics.—Dr. Maxwell E. Lapham, Jackson, is conducting a series of graduate lectures in obstetrics in several counties of the state. Each meeting is devoted to about one hour for lectures and one hour for clinical demonstrations. In addition to Dr. Lapham, who is the field clinician, the committee on postgraduate medical education is participating. This committee is made up of two members each from the Mississippi State Medical Association, Tulane University of Louisiana School of Medicine and the state board of health, and one representative from the Mississippi State Hospital Association. The next circuit of lectures is planned for the areas surrounding Cleveland, Clarksdale, Greenville, Rolling Fork and Yazoo City. Dr. Lapham conducted similar courses in Virginia in 1933 and 1934.

NEVADA

Bill Enacted.—A. 260 has become a law, creating a board to arrange for and to supply necessary maintenance, medical and surgical treatment, and hospitalization to indigent expectant mothers.

NEW HAMPSHIRE

Delegates Oppose Compulsory Health Insurance.—The house of delegates of the New Hampshire Medical Society held a special meeting, March 7, in Concord to consider the report of the meeting of the House of Delegates of the American Medical Association in Chicago, February 15-16. A resolution was adopted approving the action of the national association, opposing compulsory health or sickness insurance or other medical services under governmental control or lay supervision and approving voluntary plans for medical service under medical supervision. Copies were sent to all representatives in Congress.

NEW JERSEY

Personal.—Philip R. White, Ph.D., for the past two years fellow of the Rockefeller Institute for Medical Research, New York, has been appointed to the staff of the department of animal pathology of the Rockefeller Institute at Princeton.——Dr. Arcangelo Live, Hackensack, has been awarded the honorary degree of doctor of medicine by the University of Rome, according to the *Bulletin* of the Bergen County Medical Society.

Society News.—Dr. Pol N. Coryllos, New York, addressed the Atlantic County Medical Society, Atlantic City, March 8, on "Pathogenesis, Mechanism and Treatment of Tuberculous Cavities."——Drs. Nathan Rosenthal and Allan O. Whipple, New York, addressed the Bergen County Medical Society, Hackensack, March 12, on "Blood Dyscrasias in Children" and "Splenectomy," respectively.——Drs. William H. Park and Maurice Brodie, New York, addressed the Essex County Medical Society, Newark, March 14, on "The Newer Preventives of Diphtheria, Precipitated Toxoid and Toxoid Flocculi" and "Immunization Against Poliomyelitis," respectively.——Drs. Raymond J. Connors and Anthony Bassler, New York, addressed the Hudson County Medical Society, March 5, on "Pilonidal Sinus" and "Chronic Colitis from the Practitioner's Standpoint," respectively.

NEW YORK

Bills Introduced.—S. 2032 and A. 2455 propose to exclude from private and public schools children not immunized against diphtheria. A. 2458, to amend the law in relation to certificates of birth, proposes that, if a child is born out of wedlock, the name of the putative father shall not be entered on the birth certificate without his consent. If the putative father does not consent, the physician or the midwife, with the consent of the mother, is to supply at least two given names for the child, one of which shall serve as a surname, except that the name of any known living male is forbidden. The mother may also use the last given name as her name.

Personal.—Dr. N. Stanley Lincoln, Albany, who was provisionally appointed superintendent of the Hermann M. Biggs Memorial Hospital at Ithaca, has been transferred to the superintendency at the new tuberculosis hospital at Mount Morris. It is expected that the Mount Morris building will be ready for occupancy this month, while that at Ithaca will not be finished until late in the year, because of delays in construction.——Dr. Leon A. Chojnacki, Perrysburg, was appointed clinic physician in the division of tuberculosis of the state department of health, March 1.——Dr. Blakely R. Webster has been appointed superintendent of Dannemora State Hospital, Dannemora, succeeding Dr. Charles M. Burdick, who retired several months ago.——Dr. Frederick F. Russell, director of the International Health Division of the Rockefeller Foundation, delivered the Eastman Memorial Lecture at the University of Rochester School of Medicine and Dentistry, March 21, on "The Continuing Need for Research in the Field of Public Health."

New York City

Conference on Chronic Tuberculosis.—The Tuberculosis Sanatorium Conference of Metropolitan New York sponsored a clinical conference on chronic pulmonary tuberculosis at Cornell University Medical College recently. Speakers were Drs. Edgar Mayer and William De Witt Andrus, on "Bronchiectasis and Cystic Disease of the Lung" and "Present Status of Phrenic Nerve Interruption," respectively. Cases from the New York Hospital pulmonary service were presented.

Symposium on Headache.—A symposium on headache was presented at the stated meeting of the New York Academy of Medicine, April 4, with the following speakers: Drs. James W. Babcock II, on "The Rôle of Diseases of the Nasal Accessory Sinuses in Headache"; Webb W. Weeks, "Ocular Headache"; Alexander Lambert, "Tobacco and Drugs as a Cause of Headache"; Frederick Tilney, "Causes of Headache in General and as a Symptom of Tumors and Other Diseases of the Brain," and Foster Kennedy, "Drugs and Other Methods of Treatment."

Personal.—Dr. David J. Kaliski has been made a Chevalier of the Legion of Honor by the French government. Dr. Kaliski is a former president of the Medical Society of the State of New York and chairman of the coordinating council of the five county medical societies of New York.——Dr. George H. Reichers, chief surgeon at Bushwick Hospital, was guest of honor at a dinner given by members of the medical and nursing staffs and other friends, March 14, at the Hotel Granada. The occasion marked his thirty-fifth anniversary as a physician and twenty-two years' service at the hospital. Dr. William E. Lippold was toastmaster.——Dr. Harry Plotz, formerly of New York and now director of laboratories at the Pasteur Institute, Paris, has recently been honored by the French government by advancement from the rank of Chevalier to Officer of the Legion of Honor of France.

NORTH CAROLINA

Bill Introduced.—H. 996 proposes to authorize Cabarrus County to establish and maintain a public hospital. Among other things, the bill proposes that in the management of the hospital no discrimination is to be made against practitioners of any school of medicine "or allied occupations" recognized by the laws of the state and that all legal practitioners shall have equal privileges in treating patients in such hospitals. A patient is to have the absolute right to employ at his own expense his own physician. Such physician is to have exclusive charge of the care and treatment of the patient, and hospital nurses as to such patient are to be subject to that physician's directions.

OHIO

Bill Passed.—H. 163 has passed the house, proposing to repeal the laws regulating the sale, distribution or possession of narcotic drugs and to enact what apparently is the uniform narcotic drug act.

Executive Secretary Resigns.—Don K. Martin, executive secretary of the Ohio State Medical Association for sixteen years, resigned March 15 to become manager of the Ohio Manufacturers' Association. Mr. Martin was also general counsel for the association and editor-manager of the *Ohio State Medical Journal*.

Rabies Prevalent Among Dogs.—Ohio is experiencing an outbreak of rabies in dogs in southern counties, *Ohio Health News* reports. From Jan. 1, 1934, to March 15 of this year the laboratory of the state department of health examined 1,922 specimens and found 416 positive, 105 from one county alone. Only 430 specimens were examined in 1933. During the last ten years, fifty-eight persons have died of rabies in Ohio.

Society News.—Dr. Wells H. Teachnor, Columbus, addressed the Summit County Medical Society, Akron, March 5, on "Diagnosis of Cancer of the Rectum and Colon."——Dr. Ralph H. Major, Kansas City, Mo., addressed the Cleveland Academy of Medicine, March 15, on "Some Aspects of Arterial Hypertension."——Dr. Cyrus E. Burford, St. Louis, addressed the Toledo Academy of Medicine, February 1, on tuberculosis of the genito-urinary tract. Dr. Burford also participated in a clinic presented by the urologic department of St. Vincent's Hospital in the morning. Physicians from neighboring cities were invited. Dr. Bert W. Culver, Coldwater, Mich., demonstrated a new appliance for treatment of hip fractures.

Personal.—Dr. Henry T. Sutton, Zanesville, was entertained at a dinner at the Good Samaritan Hospital, Zanesville, April 1, in celebration of his fiftieth anniversary in the practice of medicine. Dr. Ward D. Coffman was toastmaster at the dinner, which was sponsored by the Sisters of St. Francis at the hospital. Speakers were Drs. William A. Melick, Cyrus M. Rambo and Edmund R. Brush, Zanesville; Joseph Price and Isaac B. Harris, Columbus, and Arthur L. Pritchard, Nelsonville. About fifty guests attended. Dr. Sutton was the first health officer of Zanesville and one of the founders of the hospital, according to newspaper reports. For several years he was a member of the state board of health. He was one of the founders of the Good Samaritan Hospital.

OKLAHOMA

Bills Introduced.—H. 90 proposes to accord to physicians, nurses and hospitals, treating persons injured through the negligence of others, liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons by reason of their injuries. S. 285 proposes to require all applicants for licenses to practice any form of the healing art, as a condition precedent to their right to examination by their respective professional boards, to pass examinations in anatomy, physiology, chemistry, bacteriology and pathology, to be given by a board of examiners in the basic sciences. This board is to consist of five members, members of the faculty of the state university, the state agricultural college, or some other state institution of learning in the state learned in the basic sciences and not engaged in the practice of the healing art.

PENNSYLVANIA

Bill Passed.—H. 1023 has passed the house and the senate, proposing to prohibit the sale or distribution of medicines, drugs or poisons by means of any vending machine or other mechanical device.

Graduate Conference at Wilkes-Barre.—The staff of Mercy Hospital, Wilkes-Barre, sponsored a graduate conference at the hospital, March 28. Guest speakers were Drs. Pascal F. Luccheni, Philadelphia, on "Scarlet Fever"; Elliott P. Joslin, Boston, "Treatment of Diabetes"; John F. Erdmann, New York, "Tumors of the Breast," and John Cooke Hirst II, Philadelphia, "Active versus Conservative Management of Placenta Previa."

Economics Symposium.—The Dauphin County Medical Society presented a symposium on medical economics at a meeting in Harrisburg, April 2, with the following speakers: Drs. Harold A. Miller, Pittsburgh, director, Pennsylvania State Emergency Medical Relief, "Economic Trends in Medicine as Seen from Experience with Emergency Medical Relief"; Arthur C. Christie, Washington, D. C., "Complete Medical Care for All the People Without Health Insurance," and Francis F. Borzell, Philadelphia, "Organized Medicine and Social Insurance."

Philadelphia

Society News.—Speakers at the meeting of the Philadelphia County Medical Society, March 27, were the following from Presbyterian Hospital, Columbia University, New York: Drs. Allen O. Whipple, "Surgical Interference in Tumors of the Pancreas"; Arthur H. Blakemore, "Physiologic Aspects of Carotid Jugular Anastomosis," and George H. Humphreys, "Cardiac Output Studies in Carotid Jugular Anastomoses."——A symposium on "The Problem of the Convalescent Patient" was presented before the Northern Medical Association of Philadelphia, March 18, by Drs. William D. Stroud, Thomas A. Shallow and Michael A. Burns and Ann Laws Calley, R.N.——Drs. Walter Freeman, Washington, D. C., and Bernard J. Alpers, among others, addressed the Philadelphia Neurological Society, March 22, on "Ventriculography with Thorotrast" and "The Mental Syndrome of Corpus Callosum Tumors," respectively.——Dr. Edward J. Klopp was recently elected president of the Philadelphia Medical Club.——Dr. Russell L. Haden, Cleveland, gave the "Annual Conversational Lecture" of the Pathological Society of Philadelphia, April 11, on "The Red Blood Cell in Man."

RHODE ISLAND

Society News.—Dr. Thomas H. Lanman, Boston, addressed the Providence Medical Association, March 4, on "Surgical Aspects of Pediatrics," and Dr. Henry E. Utter, on "Twenty-Five Years in Pediatrics." Speakers at the meeting April 1 were Drs. Francis H. Chafee, on "Medical Indications for Transfusions" and Jesse P. Eddy III, on "Some Surgical Aspects of Blood Transfusions."

Blood Donors' Bureau.—The Providence Medical Association has established a bureau for professional donors of blood. All donors have negative Wassermann reactions and normal hemoglobin and are in good physical condition. Calls are handled through the Physicians and Surgeons Exchange. Dr. Francis H. Chafee is chairman of the committee that arranged the service.

TENNESSEE

Bills Introduced.—H. 1092 and S. 875, to amend the workmen's compensation act, propose to compensate a workman for any "injury or disease arising out of and in the course of the employment."

Society News.—Dr. Charles C. Vinsant, Maryville, addressed the Blount County Medical Society, April 11, on "Common Diseases of the Anorectal Region."——A symposium on diseases of the spleen was presented at a meeting of the Dyer, Lake and Crockett Counties Medical Society, March 6, by Drs. Joseph A. Crisler, Peter Whitman Rowland Jr. and Russell A. Hennessey, Memphis.——Dr. Charles R. Henry, Chattanooga, addressed the Chattanooga and Hamilton County Medical Society, April 4, on "Oxygen Therapy in Pneumonia."——Dr. Gunnar Nystrom, professor of surgery, University of

Upsala, Sweden, addressed the Nashville Academy of Medicine, March 19, on "Public Medical Relief in Sweden."——Speakers at a meeting of the Black Patch Medical Society in Clarksville, March 20, included Drs. Ernest W. Goodpasture, on "Recent Advances in Study of Virus Diseases"; Horton R. Casparis, Nashville, "Nutrition of Infants and Children," and Beverly Douglas, "Skin Grafting."——Drs. Kenneth F. Maxcy, Charlottesville, and J. Edwin Wood Jr., University, Va., addressed the Johnson-Sullivan Counties Medical Society, Kingsport, March 6, on rheumatic fever.

WASHINGTON

Society News.—The Spokane Surgical Society held its first annual meeting February 9, with Dr. Waltman Walters, Rochester, Minn., as the guest speaker.——Drs. Louis H. Klemptner and Adolf J. Drüm, Seattle, addressed the Skagit County Medical Society, February 25, on "Infectious Mononucleosis" and "Cardiography in Practice," respectively.——Speakers before the Walla Walla Valley Medical Society, February 14, were Seattle physicians: Drs. James M. Bowers, Manford R. Waltz and Oscar S. Proctor, on diagnosis and treatment of diseases of the chest.

WEST VIRGINIA

Personal.—The Hancock County Medical Society gave a dinner in Steubenville, Ohio, recently, complimenting Dr. Fred B. Harrington, Weirton, who retired as secretary of the society after twelve years in the office.

Society News.—Dr. Isaac A. Bigger, Richmond, Va., addressed the Harrison County Medical Society, February 7, on primary carcinoma of the lung. Dr. Rome H. Walker, Charleston, president of the West Virginia Medical Association, and Mr. Joe W. Savage, executive secretary, also spoke.——Drs. James S. Klumpp and Walter C. Swann, Huntington, addressed the Logan County Medical Society, Logan, February 13, on "Relation Between Pelvic Conditions and General Health in Women" and "Prevention of Coronary Occlusion," respectively.——Dr. Chevalier L. Jackson, Philadelphia, addressed the Ohio County Medical Society, Wheeling, February 15, on "Indications for Bronchoscopy."——Dr. Fred W. Rankin, Lexington, Ky., discussed "Selection of Peptic Ulcer Cases for Surgery" at a meeting of the Cabell County Medical Society, Huntington, February 14.

GENERAL

Society of Neuropsychiatrists.—The Southern Neuropsychiatric Association held its inaugural meeting in Memphis, Tenn., February 5-6. Dr. Giles W. Day, Galveston, Texas, was elected president; Dr. William D. Partlow, Tuscaloosa, Ala., president-elect, and Dr. Newdigate M. Owensby, Atlanta, secretary. The territory of the new association includes the states covered by the Southern Medical Association and membership is limited to 100 fellows and twenty-five members. The next annual meeting will be held in New Orleans.

National Academy of Sciences.—Papers of medical interest to be presented at the annual meeting of the National Academy of Sciences at Washington, D. C., April 22-24, include the following:

Dr. Eugene F. Du Bois and James D. Hardy, New York, Heat Losses from the Human Body.
Dr. William G. MacCallum, Baltimore, Diabetes in Relation to the Anterior Hypophysis.
John H. Northrop, Ph.D., and Moses Kunitz, Ph.D., Rockefeller Institute for Medical Research, Princeton, N. J., Isolation from the Pancreas of a Substance Which Inhibits Trypsin Digestion and Its Effect on the Activation of Trypsin.
Winthrop J. V. Osterhout, Ph.D., and Samuel E. Hill, Ph.D., New York, Some Aspects of Anesthesia and Irritability.
Drs. Thomas M. Rivers, New York, and T. F. McNair Scott, London, England, Meningitis in Man Caused by a Filtrable Virus.
Dr. George L. Streeter, Baltimore, Significance of the Amnion.
Milislav Demerec, Ph.D., Cold Spring Harbor, N. Y., Relative Importance of Various Genes to the Organism.

Federal Food, Drugs and Cosmetic Legislation.—On April 1, the Copeland food, drugs and cosmetic bill, S. 5, was made the unfinished business of the Senate and during the ensuing week the bill was discussed on the floor of the Senate in an effort to secure its passage. After a full week's discussion and the adoption of numerous amendments, the senate, April 8, displaced the bill as the unfinished business by voting to take up another bill for consideration. This action returns S. 5 to the Senate calendar. It was acquiesced in by Senator Copeland, apparently to preclude a vote on a motion to recommit the bill to the Senate Committee on Commerce, made by Senator Bennett Champ Clark, of St. Louis County, Missouri, who, with Senator Josiah W. Bailey, of Raleigh, North Carolina, has vigorously opposed the enactment of the bill in its present form. The bill has now lost its privileged status. Whether or not it will regain that status is problematic. In any event, the outlook for the enactment during the present session of Congress of legislation needed for the protection of consumers of food, drugs and cosmetics is not promising.

Change in Status of Licensure.—The Illinois State Department of Registration took the following action, March 7:

Dr. Loring Brainard Palmer, Atlanta, Ga., license revoked for violation of Harrison Narcotic Act.

Dr. Nathaniel H. Schechter, Chicago, license restored; it had been revoked, Oct. 6, 1932, for violation of the Harrison Narcotic Act.

The Massachusetts Department of Registration in Medicine reports the following:

Dr. Joseph N. Tessier, New Bedford, license revoked, February 28, for gross misconduct in the practice of his profession.

Dr. Eli Silverman, Boston, license suspended for six months, March 14, because of deceit in connection with automobile accident insurance claims.

Dr. Joel Ginsburg, Boston, license suspended for one month, March 14, because of deceit in connection with automobile accident insurance claims.

American Chemical Society Program.—At the spring meeting of the American Chemical Society in New York, April 22-26, the program of the division of medicinal chemistry will include the following addresses:

Michael X. Sullivan, Ph.D., Washington, D. C., Guanidines as Etiologic Factors in Pathologic Conditions.
Dr. Wolfgang F. von Oettingen, Cleveland, The Development of Industrial Medicine, with Special Reference to the Tasks and Problems of Industrial Toxicology.
Michael Heidelberger, Ph.D., New York, Bacterial Proteins.
Lyndon F. Small, Ph.D., Erich Mosettig, Ph.D., Charlottesville, Va., and Dr. Nathan B. Eddy, Ann Arbor, Mich., Chemical and Pharmacologic Studies on Morphine Substitutes.
Dr. William P. Murphy and Isabel Howard, Boston, Some Effects of the Intramuscular Injection of a Concentrated Solution of Liver Extract.

This meeting of the chemical society celebrates the tercentenary of the establishment of chemical industry in the United States, dating from the year in which Gov. John Winthrop of Connecticut made a trip to England to consult with experts on the establishment of colonial industries and his first steps to carry out his plans. In this connection George W. Merck, president of Merck & Co., Rahway, N. J., will give an address in the medical division on "Chemical Industry and the Medical Profession—A Mutually Advantageous Partnership." In addition, the division will join the division of biological chemistry in a symposium on vitamins.

Medical Bills in Congress.—*Bills Introduced:* S. 2472, introduced by Senator Long, Louisiana, proposes to pay an annuity to the widow of Dr. Aristides Agramonte, of the Yellow Fever Commission. H. R. 7158, introduced by Representative Taber, New York, proposes to erect an addition to the veterans' facility at Canandaigua. H. R. 7159, introduced by Representative Wadsworth, New York, proposes to erect an addition to the veterans' facility at Batavia. H. R. 7162, introduced by Representative Dear, Louisiana, proposes to erect an addition to the veterans' facility at Alexandria, La. H. R. 7174, introduced by Representative Plumley, Vermont, proposes to erect a veterans' hospital in Vermont. H. R. 7236, introduced by Representative Underwood, Ohio, proposes to erect an addition to the veterans' facility at Chillicothe, Ohio. H. R. 7287, introduced by Representative Jenkins, Ohio, proposes to reenact all public laws granting pensions to veterans and to dependents of veterans of the Spanish-American War, including the Philippine Insurrection and the Boxer Rebellion, and medical, hospital or domiciliary treatment to former members of the military or naval service, which were repealed by the act of March 20, 1933. H. R. 7295, introduced by Representative Quinn, Pennsylvania, proposes to prohibit experiments on living dogs in the District of Columbia for any purpose other than the healing or curing of the dog. H. R. 7373, introduced by Representative Underwood, Ohio, proposes to establish a Department of Veterans' Affairs and generally to revise the laws relating to veterans. Among other things, the bill proposes to furnish domiciliary and hospital care, including medical treatment, within the limits of "department facilities," to any veteran of any war who is in need of hospitalization or domiciliary care and is unable to defray the expenses thereof, irrespective of whether the disability, disease or defect was due to service. The bill further provides that the term "veteran" shall include any individual who served overseas as a contract surgeon of the army. H. R. 7370, introduced by Representative Connery, Massachusetts, proposes to recognize the high public service rendered by soldiers who volunteered and served in trench fever experiments in the American Expeditionary Forces. H. R. 7440, introduced by Representative Casey, Massachusetts, proposes to erect an addition to the veterans' facility at Bedford, Mass. H. R. 7455, introduced by Representative Evans, New York, proposes to authorize the appointment of registered pharmacists as first and second lieutenants in the Medical Corps of the Army and the Medical Officers' Reserve Corps.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 23, 1935.

The Struggle of the Osteopaths for Registration

At the proceedings of the house of lords, before the select committee on the bill for the registration and regulation of osteopaths, an important witness for the applicants was Dr. W. K. Macdonald, a qualified physician who practices osteopathy. He took his M.D. degree at Edinburgh and graduated as a doctor of osteopathy at Kirksville, Mo., where he became a professor. He did not consider that osteopathy could yet be dignified by the term science; "like medicine it was still an art." Asked to describe the osteopathic lesion, he said that it was not a dislocation but rather the complete or partial fixation of a joint within its normal range of movement, accompanied by certain changes in the chemistry, structure and function of the surrounding tissues. These lesions were either primary, being brought about by strain, injury or bad posture, or secondary, generally the result of nerve reflexes, caused by some disturbance, abuse or disease condition of some part or organ. Osteopathic lesions were evidenced by inspection, palpation and testing for passive movements in joints. They were so slight that few radiologists were capable of recognizing them unless specially trained. Asked about osteopathic research, he said that osteopathy was young. He did not claim that osteopathy could cure all diseases but that "there is no disease, acute or chronic, in which osteopathic treatment has not some important and irreplaceable part to play." He was cross-examined by Sir William Jowitt, the lawyer who appeared for the British Medical Association. He was asked whether the vast majority of scientific opinion in this country, not merely that of physicians, was against the bill. He agreed but said that scientific men had not taken the trouble to investigate the claims of osteopaths. Had osteopathy no supporters among the scientists of the continent? He gave a similar answer. Asked what subjects in the medical curriculum he would omit in the training of osteopaths, he mentioned materia medica, pharmacology and therapeutics. He also thought that a shorter course in bacteriology should be given. Also the practice of osteopathy should be substituted for the practice of medicine. Asked whether he would use antidiphtheric serum he said he would, but that he would also treat the patient osteopathically. He admitted that in diphtheria the body does not provide adequately the healing power (this is contrary to the fundamental dictum of Still); also that in diagnosis there was no difference between osteopaths and physicians, but in a large number of cases of sickness it was impossible to make a diagnosis. There was disharmony in the body which preceded the recognizable effects of diseases and it was for evidences of this that osteopaths looked. Was typhoid caused by B. typhosus? Yes, but if the bacillus obtained entrance into a healthy bowel there was less chance of disease. Had he any evidence that persons who escape are osteopathically sound? He had not. What was the osteopathic treatment of pernicious anemia? To treat any osteopathic trouble by manipulation of the spinal column and work on the nerve centers, which had been proved by experiments in the laboratory to have an influence on blood cells. What about the work of Minot? He admitted that this was valuable and he advised liver treatment. But osteopathic treatment influenced the liver and helped. Challenged on the last claim, he could produce no evidence. He never treated cancer by manipulation. Why should not candidates qualify as physicians and then study osteopathy in a postgraduate course? He answered that it was unfair to ask them to spend seven or eight years on their course. In all his cases of diphtheria he had found subdislocations of the spine.

CROSS-EXAMINATION BY LORD DAWSON

Dr. Macdonald was then cross-examined by Lord Dawson, president of the Royal College of Physicians. Could he produce scientific evidence under the headings (1) x-ray methods, (2) a recorded series of cases, (3) necropsies as to the osteopathic treatment of epilepsy? He answered that the evidence was to be had, but when asked whether absolutely and systematically arranged he said "Not as I would lay it out if I were going to a medical meeting." After further questions, Lord Dawson said: "Do you know what makes me despair of this inquiry? I cannot nail a single thing to the counter. I have done my level best to look at this with complete impartiality. Unless we can get well defined answers to certain questions this inquiry is futile. I have never been mixed up with an inquiry where it was so difficult to get an answer. You have said that in diphtheria you would use serum. Yes. In syphilis would you use mercury? Yes. Before asking the nation to change its whole policy, osteopaths must prove their case." Dr. Macdonald then said: "This is the first time that any responsible person in this country has ever been willing to investigate osteopathy. We have our proof ready. We are prepared to take our stand on several bulletins I have produced at this inquiry, with two or three articles out of the *Journal of the American Osteopathic Association*. The medical profession has never investigated osteopathy." To this the reply can be made that whatever the alleged evidence—and a case of some kind can be made out for almost any treatment—it is manifestly not sufficient to enable Dr. Macdonald or the osteopath who preceded him to give satisfactory answers to the crucial questions put to them in cross-examination.

The inquiry continues.

The Extermination of Imbeciles

At the Eugenics Society, Dr. Frederick Grundy, health officer, gave the results of a mental survey of the school population in Northeast Suffolk. In a school population of 6,600 he found 165 defectives, 135 feebleminded, 23 imbeciles and 7 idiots. Half the children certified as feebleminded in the educational sense would not be classed as feebleminded when they reached adult years in rural areas. Feeblemindedness was greatest in the areas more isolated geographically, where migration of the fittest caused increasing concentration of the poorer stocks. Parentage by the deficient should be prevented by compulsory or voluntary sterilization. They might be kept in colonies where they could be provided with what occupation they were capable of. As to imbeciles, there was only one thing to do with them—to exterminate them as they arose. He made this suggestion purely on humanitarian grounds. It was not fair to the low-grade defectives themselves to allow them to survive.

Murder by Injecting Plague Bacilli

A crime is reported from India of a kind so far unknown in Great Britain—murder by injecting disease germs. The case, which has been before the Indian courts since December 1932, has ended in two death sentences. Amarendra Chandra Pande, an Indian, aged 21, had a large interest in an ancestral estate. A first attempt to kill him was made by his stepbrother, Benoyendra Chandra Pande, who presented him with a pair of new spectacles on the bridge of which was smeared a culture of plague bacilli. Amarendra returned them, as they did not fit. But Benoyendra said this was nonsense, placed them on his brother's nose and forced the bridge down so firmly that Amarendra said "It felt as if a vein in my head had burst." A few days later he became ill with lockjaw and, though the illness was serious, he recovered. It seemed then, said the prosecution, that the conspirators considered that the

virus was not powerful or fresh enough. There was only one place in India at which an active culture of plague bacilli could be obtained—the Haffkine Institute, Bombay. Benoyendra went there but found that only a physician could obtain a culture. Dr. Taranath Bhattacharya, a research worker in Calcutta and a brother-in-law of Benoyendra, then came on the scene. He stated that he was experimenting with a cure for bubonic plague and obtained a culture. The scene then shifted to the crowded railway station of Howrah, Calcutta, on a day selected when Amarendra was going away. At the trial a witness stated that Amarendra told him in the railway carriage that when he was in front of the ticket office a dark complexioned man, clad in white, brushed past him and he felt a prick. He traveled as far as Pulsour, a distance of 150 miles, but returned on the next day as he felt ill. Some eminent physicians saw him in consultation and he died after a few days' illness, and was cremated. The report does not state what diagnosis, if any, was made. Benoyendra was found guilty of plotting his death to obtain his estate and Dr. Bhattacharya of conspiring to commit murder. Both were sentenced to death. It is to be noted that it was not actually proved that Amarendra died from plague, though all the circumstances point to this as well as to the conspiracy to murder him.

PARIS

(From Our Regular Correspondent)

March 15, 1935.

The Objectives of Eugenics

Professor Pinard, at the dedication exercises of the new Institute of Social Medicine at Lille, stated that the science of eugenics should form a part of the curriculum of such an institution. The program of this institute includes not only research that is entirely of historical or scientific character but also a study of how one can improve the human race, such as the problems relating to heredity, alcoholism, syphilis, movement of population and the management of delinquency. It is essential that the physicians of France should interest themselves in the theoretical discussions concerning eugenics, because some day they may be called on to give their opinion on the methods of application of certain of its principles. The cooperation of medical men is indispensable to the enforcement of laws that will be passed when some of the modern principles of eugenics are to be enforced, as has already been the case in other countries. The means employed thus far to improve the human race can be placed under three heads or groups:

The first method, which can be termed "negative eugenics," aims to sterilize those who have hereditary or physical defects, as has been carried out in the United States and more recently in Germany. This is what Couvelaire terms "destructive eugenics." A less severe barrier is to place a veto on the marriage of certain individuals as the result of an obligatory premarital examination. Under the same heading belongs the birth control movement, which furnishes contraceptive remedies to those who live in physical or moral misery. This method, however, as experience teaches, is more likely to decrease the birth rate as a whole than to prevent the birth of the undesirable. At the third International Eugenics Congress, Sir Bernard Mallet stated that birth control had a "dysgenic repercussion" by decreasing the fecundity of those in the better social stratum, while it leaves practically unchanged the fecundity of individuals not qualified to reproduce. The practical application of sterilization and interdiction of marriage have encountered almost insurmountable obstacles. As Dr. Pupil-laut has said, even if one can accept theoretically the idea itself of hereditary transmission to offspring of the taints of those unfit for modern society, one is convinced that the laws of inheritance of each normal or pathologic characteristic, especially in the intellectual sphere, differ sensibly from the laws of anatomic heredity. The laws of heredity in the intellectual sphere lack precision and are to yet known so little that one cannot put theories into practice. Such is the opinion of the majority of those best informed on the subject of eugenics in France. It differs from that held in the United States, the Scandinavian countries, and more recently in Germany. Abortion is today regarded as a legal eugenic measure in Russia.

The second group is termed "positive eugenics." Those who favor this method believe that it is easier to apply legal methods than to suppress or reduce the fecundity of the unfit; that is, to put into practice "negative eugenics" as opposed to "positive eugenics," which favors the birth of individuals who are well endowed physically and mentally. The idea of positive eugenics is a rational one and would be of unquestionable social utility if it could be applied. It is a direct attack on human liberty and its results are no less certain than those of "negative eugenics." The idea of "positive eugenics" is to create a superior human race just as one tries to breed a similar race of superior animals.

A third formula is that of "corrective eugenics," the possibilities of which are more acceptable. This is being applied in France in the form of "prenatal puericulture," which aims in a modest manner, without the use of force but simply by self discipline, to secure all that is best from the human assets at its disposal. Prenatal consultations, centers of puericulture, homes for mothers, antisyphilitic dispensaries and annexes to maternity hospitals have all greatly lessened the percentage of abortions and deaths of mothers and infants. It is necessary to extend this campaign of vulgarization of the laws of hygiene to the prospective fathers as well as to the mothers. Professor Pinard has proposed a law making a health certificate necessary before marriage licenses can be issued. French eugenists do not believe, however, that such a law will prevent any more unfit human beings to be born. Professor Pinard is an ardent supporter of the idea of vulgarization of the laws of hygiene and believes that it will result in attracting the attention of those who have hereditary taints, especially syphilis, to the danger of having unfit offspring. Such a method of "corrective eugenics" does not interfere with personal liberty but aims by education to improve the individual conditions of procreation. This will be the task to which the medicosocial department of natality of the new Institute of Social Medicine at Lille will devote itself.

New Journal on Immunology

The first issue of the *Revue d'immunologie* appeared in January. The editors, all well known in the field of immunology, are Profs. Robert Debré, G. Ramon and Pasteur Vallery-Radot, the grandson of Louis Pasteur. In the introduction, Prof. Jules Bordet stated that such a journal fills a long-felt want for the publication not only of reviews of articles in this special field, which appear in foreign journals, but to enable the large number of papers emanating from French sources and which are widely scattered in various journals to be subjected to a critical evaluation before being published in a single special journal. In the first issue are papers by Charles Nicolle, an internationally known bacteriologist, on immunity and immunization against typhus exanthematicus, one by Ramon on antidiphtheria and antitetanic vaccination by means of specific anatoxins, one by Pasteur Vallery-Radot on the parallelism between provoked and spontaneous anaphylaxis, an article on the method of action of the immunity created by diphtheria anatoxin, by Ramon, Debré and See, and one by Jean Hamburger on the problem of allergic migraines. The first issue reflects the great advance in research in the field of immunology made by French immunologists.

BERLIN

(From Our Regular Correspondent)

Feb. 11, 1935.

The Results of the Publicity Campaign on Cancer

Concerning the value or the danger of a publicity campaign on cancer the views of experts differ widely. It is therefore perhaps of interest to report on some recent utterances that have been published in various parts of the German reich. At the session of the Vereinigung nordwestdeutscher Chirurgen, Kingrom, of the surgical clinic of the University of Greifswald (Pomerania), spoke on the subject. In this clinic, observations on more than 2,300 cancer patients have been made over a period of twenty-three years, with fairly detailed information on each individual case. Attempts to enlighten the people on cancer problems by means of distributed leaflets and lectures have not proved successful in this province. Better results were secured through careful instruction of the care-taking personnel and the workers in the large leagues, including the official welfare workers. The greatest success has been achieved by a thorough training of the students and by the organization of continuation courses for physicians. To these measures is due the fact that in recent years cancer patients have been coming earlier for operation. The value of roentgen examinations for the diagnosis is great but must not be overestimated. Bioptic excisions should be made only in very obscure cases and only by the surgeon. No harm is done by such excisions, in the opinion of Professor Anschütz, of Kiel.

The experiences in other regions appear to be different. In Berlin, Hintze, roentgenologist in the surgical clinic in charge of Bier, announced recently that the knowledge of cancer in the medical profession and also among the people had improved to such an extent that four fifths of the cases of cancer of the breast had been found operable by this clinic.

The reports from Baden, on the other hand, are less favorable. In the surgical clinic of the University of Freiburg, Dr. Karitzky studied the results of cancer publicity in Baden. He examined the records of about 1,800 patients who had been operated on for malignant growths during the period 1920-1933. He reached the conclusion that the campaign for the enlightenment of the people on cancer problems (with the exception of skin cancers) had had little influence on the usual delay of patients before consulting a physician or on the operability of the tumors. The benefits that patients derive from such a campaign are exceedingly small, while in some instances, owing to the unnecessary fear aroused, great damage is done. In view of these observations, the Freiburg clinic refuses to participate in any publicity campaign, especially (which constitutes a weighty argument) so long as no reasonably sure cure is available.

Finally, Hamburg has published its observations on an interesting series of cases. In Hamburg the notification of tumor patients is not compulsory. Compulsory notification is regarded as impracticable, so long as a rapid and sure diagnosis of the early cases—the beginning stage—is impossible. Publicity campaigns, or attempts to enlighten the people on cancer by means of distributed leaflets, placards, and the like, are not in favor in Hamburg. It is held that the daily papers contain enough such information. There is, however, a sort of welfare center for cancer patients. There are three welfare aid workers who support the activities of the physicians by general control measures, by constant contact with the cancer patients, and by keeping a central file of the record cards of all patients. Patients belonging to the insured class (that is, members of the health insurance associations) receive adequate care, so that for them no special institutes for early diagnosis are needed. They are needed, however, for the noninsured; that is, for certain persons of small means, and also for the well-to-do class. These institutes, together with their equipment, should be available for all physicians. Some interesting facts are deducible from the Hamburg statistics. Compared with the total number of deaths, 26 per cent of the male and 25.5 of the female cancer patients had had no contacts with the welfare aid service. In the opinion of the head municipal physician, a remedying of this defect ought to be possible if a closer cooperation of all physicians could be secured. On the other hand, the number of patients cared for in 1934 increased by 1,000, which was doubtless due to the greater energy developed and not necessarily to any increase in the number of cancer cases. Among these patients there were three times as many women as men. For example, in one week of December 1934 the total number of patients being cared for by the welfare aid service was 5,257 (1,384 men and 3,873 women). Likewise the combating of quackery in Hamburg has achieved considerable success. The authorities have put an end to the fraud perpetrated in the form of alleged radium jars. Publicity lectures by laymen are no longer permitted. One unethical radiologic institute has been closed. The advertising pages of all Hamburg daily papers are, and have been for many years, strictly censored.

The Crusade Against the Improper Sale of Medicines

For many years a campaign has been carried on against the improper advertising and sale of medicines; but with the advent of the new régime the crusade has been pursued with doubled energy. A previous letter told of the introduction of new police measures dealing with the subject in Prussia (THE JOURNAL, Aug. 12, 1933, p. 536). Two recent occurrences will illustrate the vigor with which the laws are being enforced. In Munich, the three partners of a firm were arrested "by reason of conduct bringing damage to the people" and some of them were taken to a concentration camp. They had pushed the sale of alleged remedies that, in point of fact, had no practical value, and in their advertisements they had made improper use of statements made by certain federal ministers. It was found that a "bath improver" sold by them consisted almost exclusively of turpentine and soft soap. The firm charged 22 marks for a package of the article, whereas the cost of production was about 2.20 marks.

Interest attaches also to a decision of a superior court. A daily paper had warned its readers, composed to a great extent of farmers inexperienced in such matters, against the purchase of expensive remedies that are at least of doubtful efficacy if not absolutely worthless. The articles aimed at more particularly were "radium pillows" and "ultra-active radium salts." The firm exploiting the articles brought suit against the newspaper containing the warning. The court rendered a decision adverse to the plaintiff, which was based not only on the opinions of the experts summoned by the court but also on the listed duties that the new laws impose on editors; for recent legislation requires editors to place movements in the foreground that are designed to promote public welfare. Collaboration in the production of the intellectual contents of the newspapers is regarded as a public task. Hence the newspaper acted in a manner to preserve justified interests, even though the warning may have proved harmful to the firm concerned.

Medical Practice Pertaining to Accidents

Medicine pertaining to accidents is gaining in importance and is developing more and more into a complicated field of activity. Evidence of this fact was furnished by the session of the Deutsche Gesellschaft für Unfallheilkunde, which was held recently in Würzburg and was well attended. The steady increase of accidents has brought medicine pertaining to accidents, also from the medicolegal point of view, into the fore-

ground. As the chairman, Prof. F. König, surgeon, of Würzburg, pointed out, the question of compulsory acceptance of a needed operation appears to be sufficiently clarified to justify the expectation that within a reasonable time new legislation on the subject will be forthcoming. In hospitals and in university clinics the creation of special departments for the handling of accidents and the extension of existing special equipment furnish evidence of a desire to take account of the increasing need of better facilities for the care of persons injured in accidents. By the organization of special courses the faculties of medicine have met the demands for special training in the handling of accidents, as expressed by the oncoming generation of physicians. Professor König brought out further that, if surgeons attached to the university clinics should develop a special interest in medicine pertaining to accidents and should desire to give up general surgery and to enter the special field of "accident surgery," it must be expected that these physicians, who voluntarily renounce every other surgical activity in the interest of health insurance policyholders (krankenkassen and the like), will find the way prepared for the creation of an independent hospital for accidents.

CEREBRAL AND CRANIAL INJURIES

The first main topic dealt with was "Cerebral and Cranial Injuries." Speaking from the neurologic point of view, Heyde of Würzburg brought out that extensive cerebral injuries may cause relatively slight disturbances, whereas cerebral injuries of slight extent may cause serious disturbances. Not infrequently, in cases that, during the lifetime of the patient, could not be correctly judged, the actual connections are clarified at necropsy by the pathologic examination of the brain; hence in all cases of cerebral injury an anatomic examination of the brain should be demanded as a routine principle. In open cranial injuries, owing to an increase of the internal cerebral pressure, a primary cerebral prolapse may occur, with a menace of meningitis and cerebral infection. Further on there is danger of a late secondary infection, late abscess and traumatic epilepsy. Provided an operation within from six to twelve hours is possible, Wanke of Kiel pointed out that, in open cranial injuries, only closed treatment is indicated, together with scrupulous removal of contusionated tissues and primary closure of the wound. The results are much better than with the half-open, or with the open, wound treatment, with the many possibilities of complications. Of the patients given closed treatment, only 6 per cent developed a traumatic epilepsy, as compared with 12 per cent receiving open treatment.

Tönnis of Würzburg emphasized that intracranial hemorrhages may require a surgical intervention long after the accident. He warned against the customary plugging treatment in late epilepsy. Importance attaches to the loosening of the scar, which should be cut out; then the edges of the dura are sutured to the periosteum, without the introduction of any plastic equivalent to remedy the defect.

The question was discussed as to whether, on the basis of previous experiences, it was correct to insist on the patient remaining six weeks in bed in the event of concussion of the brain. Sommer of Dortmund had found that in many cases bed rest for from eight to ten days will suffice, but he emphasized that one should insist on the patient remaining at least three weeks in the hospital.

THE IRRITABLE KNEE

The second main topic on the program was "The Irritable Knee." The speakers were Bürkle de la Camp of Bochum, Andresen of Bochum, and Gebhardt of Hohenlychen. It should be borne in mind that capsular changes, injuries of the ligamentary apparatus or the menisci, pathologic changes in the articular cartilage and retention of wedged-in tissues—alone or in combination—may cause disturbances in the function of the knee joint, which must be taken into account in examining an irritable knee joint. The roentgenogram does not always aid in clarifying the diagnosis. Especial attention should be given to the knee joints that are subjected to constant occupational injuries; for example, in miners. Anatomopathologic examination of such joints in miners will clarify in part the chronic irritation symptoms with their sequels. One may find evidence of transitions between erosion manifestations in the knee joint and constant occupational injuries.

BELGIUM

(From Our Regular Correspondent)

Feb. 19, 1935.

The Advertising of Pharmaceuticals

At the third congress of the Fédération de la presse médicale latine, Professor Gunsburg of Antwerp and Dr. Watry of Brussels discussed the relations of the medical press and the advertisers of pharmaceuticals. They took up (1) the possible advantages and disadvantages of advertising in medical journals, (2) advantages of advertising for the various interests, (3) dangers of medical advertising, and (4) amicable relations between the medical press and the advertisers, and professional ethics as affecting physicians and advertisers. The speakers concluded that the chief rôle of advertising in the medical journals is to make known in a scientific manner the new things in therapeutics and instrumentation, and to create a feeling of confidence between the manufacturer of pharmaceuticals and the medical profession. The absolute independence of the editorial department must be preserved, and the greatest frankness must constitute the basis of advertising agreements and contracts. Rules affecting the ethical relations of the medical press and advertisers are to be drawn up by the Fédération de la presse médicale latine, which will serve as a basis for the settlement of any controversies that may arise.

Blood Transfusion Service

The central Red Cross blood transfusion service has begun to function. The purpose of the new service is to place donors previously examined and controlled in a systematic manner at the disposal of hospitals, clinics and the medical profession in general. In response to a day or night call, this central service will send donors to any place indicated. The donors all carry an identification card, which shows also the blood group (the Moss classification) to which they belong. The identification cards are inspected every three months by the physician in charge of the "technical committee." The physician who performs the transfusion must indicate on the identification card the date and the place of the transfusion and the quantity of blood withdrawn. If need be, the service will supply physicians with the instruments required for transfusion. On request of families or of the attending physician, it will give the names of physicians especially qualified to perform a transfusion and in a position to respond promptly to a summons. The organization of such a service has necessitated the creation of a strict examination and control. Thus, donors agree to present themselves every three months at the headquarters of the central service to have the identification card visaed. They agree to report also any disease that they may contract, or any circumstance that would prevent them either for the time being or indefinitely from responding to a call.

The Centenary of the Royal Society of Medicine

The centenary of the Royal Society of Medicine of Ghent was celebrated with éclat. More than 300 physicians from France and from all parts of Belgium responded to the summons of the committee, desiring to show their interest in the movement by their presence. On this occasion Mr. Bervaques,

secretary of the society, gave a historical account of the work of the society, the motto of which is "science and philanthropy," which has been exemplified by the great service rendered in the development of medical science, by the amicable collaboration with the university, and by the comfort it has given the poorer classes by creating free consultation centers for the indigent.

The Centenary of the University of Brussels

The ceremonies in celebration of the hundredth anniversary of the founding of the University of Brussels were honored by the attendance of the king. The minister Paul Hymans, chairman of the council on administration, gave a historical account of the work of the University of Belgium from the time when Theodore Verhaegen demanded its creation down to the wonderful developments that all can witness today. During the course of his address, the eminent minister took frequent occasion to pay homage to the physicians. Rommelaere, Héger, Brachet, Depage and many other professors of the Faculty of Medicine, in addition to the services that they rendered in training, by their instruction, scientists and practitioners, or in advancing the cause of science by their researches, consecrated themselves devotedly to improving the university as a whole. A series of lectures was delivered by the professors of the university, special mention being made of the address of Professor Dustin on "Medicine and the Liberal Type of Examination." The speaker considered in turn the past twenty-five years of the Faculty of Medicine of the University of Brussels, the progress realized in medicine during the past century, and the history of medicine from Hippocrates down to the present.

After recalling the marvelous institutes erected twenty-five years ago, through the initiative of Paul Héger and the generosity of the Solvays, the Warocquais and the Janssens—institutes that the unceasing progress of science and the needs of modern research, demanding the proximity of an active clinic and laboratory, have caused to become, in a measure, obsolete, after so brief a time, the speaker observed, with just pride and satisfaction, that the modern institutes and the Hôpital St. Pierre (about ready to open) were erected, with the aid of the Rockefeller Foundation, at Brussels for good reasons. It was owing to the reputation of its investigators and the spirit that animates them, as expressed in the persons of Depage, Bordet and Brachet, among others, that the University of Brussels secured this marvelous gift. Under the influence of Laënnec, Pasteur, Lister, Virchow, Roentgen and of Bordet, Gengou and Ehrlich, medical science, during the past century, has undergone a rapid and marvelous development. Other epochs, to be sure, have had similar medical apogees: Hippocrates, Aristotle, Galen, Vesalius, Morgagni and Bichat—to cite only a few names—played an important part in holding aloft the torch of science; but during those distant epochs the light of knowledge pierced with difficulty the density of ignorance. Recent acquisitions are introduced more easily and more rapidly to the benefit of the masses than did the first forward steps, owing to the unwillingness of an ignorant and superstitious people to accept them. While it is true that, at the present time, men of science understand one another very well and the objects of their researches, irrespective of the milieu, the speaker held that the shackles from which, during the course of centuries, scientific research and particularly medicine have freed them might bind them again some time in the future. The art and science of medicine are evolving constantly; they will not be tomorrow what they are today. They may and they should become rationalized; they should not be made servile or be functionalized.

Science is a vivacious plant and demands a liberal space for its normal development. It cannot be domesticated. Those who wish to cultivate it can do so only under full and complete liberty.

Child Mortality

At the Ecole de puériculture, and in the presence of her majesty the queen, Dr. Lust delivered recently an interesting introductory lecture. The following excerpts will demonstrate the results secured by the various societies established in Belgium for the protection of children. In 1919 was founded the Oeuvre nationale de l'enfance, an official organization generously subsidized by the public authorities. Its purpose is to coordinate, promote and stimulate private initiative. It inspects and controls the activities of the societies, subsidizes them if need arises, and carries on a wide publicity campaign with a view to making better known the essential ideas of child hygiene and the advantages of breast feeding by the mother. It supervises, through the physicians and the nurses of the consultation centers for nursing mothers, children who are being guarded or who are being nursed outside the home. Its social service considers requests for aid in favor of children. In 1933 the Oeuvre nationale de l'enfance controlled 1,174 consultation centers for nursing mothers in 649 communes, 225 prenatal consultation centers, six homes for mothers or expectant mothers, sixty-four day nurseries and nursling centers, and thirty-three vacation colonies for weakly children. All these societies owe their creation to private initiative but are inspected and supervised by the Oeuvre nationale. The Oeuvre nationale de l'enfance directs personally seven colonies for weakly and convalescent children, two institutions for the reeducation of abnormal children, and a small model nursling center. This enumeration evidences the activity of this organization and the great progress that is being made in Belgium in the crusade against child mortality. Not only has child mortality been diminished, but the daily clinical experience goes to show that the nurslings of 1934 are better cared for and are more robust than their parents were at the same age.

Many countries have reduced child mortality to a greater extent than Belgium. Some twenty countries lose proportionately fewer nurslings than this country. Whereas in New Zealand only thirty-two infants per thousand die under 1 year of age, there are fifty-seven in Sweden and ninety-two in Belgium. There is another means that might be employed to save many infants from an untimely death. Among the factors that influence morbidity and mortality among young children, the author mentions unhealthful and crowded dwellings, inadequate aid to weakly and sickly infants, the separation of mother and child, and the inadequate number of competent aids in the societies for the protection of children.

Marriages

DANIEL R. WILSON, Kansas City, Kan., to Miss Ethel Lorene Matts of Topeka, at Kansas City, Mo., January 16.

JOSEPH LAYMAN GUFFY to Miss Emily Denson Payne, both of Birmingham, Ala., February 16.

ALBERT JOHN BRANDT, Youngstown, Ohio, to Miss Elizabeth Bell of New Castle, Pa., March 2.

CHARLES N. MANLEY, Cincinnati, to Miss Kathleen Kirk of Memphis, Tenn., February 9.

EDWARD M. LIPSETT, San Francisco, to Miss Sonya Saylin at Reno, Nev., February 17.

BENJAMIN E. URBAN to Miss Marian Daneman, both of Milwaukee, February 7.

PAUL R. ROLLINS, Seattle, to Miss Martha Harlan of Farmington, Mo., January 1.

CHARLES A. BAYER to Miss Mildred Mason, both of Toledo, Ohio, February 19.

RAYMOND L. HILSINGER to Miss Angelese Hays, both of Cincinnati, recently.

JOHN P. MCVAY to Miss Josephine Mears, both of Seattle, April 4.

Deaths

William Fowke Ravenel Phillips ● Washington, D. C.; Columbian University Medical Department, Washington, 1890; professor of anatomy, Georgetown University School of Medicine; professor of hygiene, George Washington University, 1891-1892 and 1895-1900, dean of the department of medicine, 1904-1909, and professor of practical anatomy, 1905-1909; professor of anatomy, University of Alabama School of Medicine, Mobile, 1911-1913, and the Medical College of South Carolina, Charleston, 1915-1933; medical climatologist for the U. S. Weather Bureau, 1895-1904, and librarian, 1898-1904; member, in 1902 vice president and in 1905 president of the American Clinical and Climatological Association; member of the South Carolina Medical Association; secretary of the Anatomical Board of the District of Columbia, 1902-1911; fellow of the Federation of State Medical Boards of the United States; aged 71; died, February 16, in the Georgetown University Hospital, of pneumonia.

Douglas Fox Wood, Minneapolis; McGill University Faculty of Medicine, Montreal, Que., Canada, 1900; member of the Minnesota State Medical Association, and the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; formerly on the staffs of the Northwestern, Abbott, and Swedish hospitals; aged 60; died, February 9, in St. Petersburg, Fla., of coronary occlusion.

Lester Floyd Clelland, Lisbon, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1912; member of the Medical Society of the State of New York; served during the War; bank president; health officer of Lisbon since 1916; for sixteen years president of the board of education; for six years district coroner; aged 55; died, February 19, of pulmonary embolism.

James Vance McGeachan, Fayetteville, N. C.; University of Maryland School of Medicine, Baltimore, 1893; past president of the Medical Society of the State of North Carolina; formerly member of the state legislature; county coroner; at one time trustee of the University of North Carolina School of Medicine, Chapel Hill; aged 64; died, March 13, in Lumber Bridge, of cerebral hemorrhage.

Jonathan B. Vail, Lima, Ohio; Medical College of Ohio, Cincinnati, 1871; member of the Ohio State Medical Association; Civil War veteran; at one time mayor of Kalida; formerly city health officer and member of the school board; trustee of Miami University, Oxford, since 1911; aged 90; on the staff of the Memorial Hospital, where he died, February 14, of senility.

George Louis Vogel ● Boston; Harvard University Medical School, Boston, 1900; served during the World War; member of the New England Otological and Laryngological Society; for many years on the staff of the Boston City Hospital; aged 61; died, March 12, in the Trumbull Hospital, Brookline, of streptococcic septicemia the result of osteomyelitis.

Charles Clyde McLean ● Dayton, Ohio; Medical College of Ohio, Cincinnati, 1895; member of the Associated Anesthetists of the United States and Canada; past president and secretary of the Montgomery County Medical Society; aged 62; on the staff of St. Elizabeth's Hospital, where he died, March 12, of cerebral hemorrhage.

Edward William Whitney ● Northampton, Mass.; Harvard University Medical School, Boston, 1903; member of the American Psychiatric Association and the New England Society of Psychiatry; medical superintendent of the Northampton State Hospital; aged 55; died, February 16, of cerebral embolism and chronic endocarditis.

William Thatcher Baker, Dallas, Texas; Atlanta (Ga.) Medical College, 1895; past president of the Dallas County Medical Society and the Ellis County Medical Society; on the staff of the Parkland Hospital; served on the examining board during the World War; aged 71; died, February 19, of Hodgkin's disease.

Benjamin Chester Everall, San Antonio, Texas; Drake University College of Medicine, Des Moines, Iowa, 1907; fellow of the American College of Surgeons; formerly on the staffs of the Allen Memorial, Presbyterian and St. Francis hospitals, Waterloo, Iowa; aged 53; died recently, of amebic dysentery.

Ralph Clinton Larrabee ● Boston; Harvard University Medical School, Boston, 1897; member of the New England Pediatric Society; formerly associate professor of clinical medicine, Tufts College Medical School; on the staff of the Boston City Hospital; aged 64; died suddenly, March 9.

John Marshall Barnwell, Florence, S. C.; Medical College of the State of South Carolina, Charleston, 1913; served during the World War; on the staff of the Saunders Memorial Hospital; aged 43; died, February 24, in St. Joseph's Sanatorium, Asheville, N. C., of pulmonary tuberculosis.

Noble William Miller, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; served during the World War; aged 52; died, March 23, in the Veterans' Administration Facility, Hines, of hemorrhage, the result of a peptic ulcer.

Edward Lawrence Peirson, Salem, Mass.; Harvard University Medical School, Boston, 1888; member of the Massachusetts Medical Society; for many years on the staff of the Salem Hospital; aged 72; died, January 18, of hypertension, heart disease and chronic arthritis.

Isabel Taylor Macmillan, New York; Woman's Medical College, Chicago, 1889; member of the Medical Society of the State of New York; on the courtesy staff of the New York Infirmary for Women and Children; aged 72; died, March 26, of arteriosclerosis.

Augustine Joseph Molloy, Bayonne, N. J.; Columbia University College of Physicians and Surgeons, New York, 1896; Dartmouth Medical School, Hanover, N. H., 1896; on the staff of the Bayonne Hospital; aged 62; died, February 23, of endocarditis.

James Saundry Trowbridge ● Montebello, Calif.; Northwestern University Medical School, Chicago, 1905; member of the Associated Anesthetists of the United States and Canada; served during the World War; aged 64; died, February 11, of heart disease.

Thomas Byrne Walsh, Syracuse, N. Y.; Syracuse University College of Medicine, 1919; member of the Medical Society of the State of New York; aged 44; died, February 9, in the Syracuse Memorial Hospital, of coronary thrombosis and pericarditis.

John R. McCurdy ● Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1900; member of the Associated Anesthetists of the United States and Canada; aged 60; died, March 9, of cerebral hemorrhage and arteriosclerosis.

John Archibold, Cohoes, N. Y.; Albany Medical College, 1888; member of the Medical Society of the State of New York; formerly mayor and health officer of Cohoes; on the staff of the Cohoes Hospital; aged 74; died, March 4, of cerebral hemorrhage.

William S. Powell ● Defiance, Ohio; Jefferson Medical College of Philadelphia, 1874; past president of Defiance County Medical Society; formerly on the staff of the Defiance County Hospital; aged 84; died, March 3, of fracture of the hip.

George Washington Bamba, Shepherdstown, W. Va.; University of Maryland School of Medicine, Baltimore, 1897; on the staff of the King's Daughters' Hospital, Martinsburg; aged 79; died, February 26, of cirrhosis of the liver.

Charlotte Belle MacArthur, Willard, N. Y.; Northwestern University Woman's Medical School, Chicago, 1897; for many years on the staff of the Willard State Hospital; aged 66; died, February 19, of carcinoma of the lung.

James Estelle Dunlap, Schlater, Miss.; Memphis (Tenn.) Hospital Medical College, 1912; member of the Mississippi State Medical Association; served during the World War; aged 47; died, March 12, of heart disease.

John Lewis Peppers ● Webster City, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1902; past president of the Twin Lakes District Medical Society; aged 64; died, January 20, of heart disease.

Myron C. Hawley, Randolph, N. Y.; University of Buffalo School of Medicine, 1881; member of the Medical Society of the State of New York; aged 78; died, February 24, of diabetes mellitus and cerebral hemorrhage.

Martin Joseph Cooney, New York; Georgetown University School of Medicine, Washington, D. C., 1906; served during the World War; aged 55; died, March 6, in the Bellevue Hospital, of skull fracture.

Benjamin Edwin Moody, Hutchinson, Kan.; Missouri Medical College, St. Louis, 1884; formerly on the staff of the Kansas State Hospital, Larned; aged 75; died suddenly, February 16, of heart disease.

Ernest Spencer, Bel Alton, Md.; University of Maryland School of Medicine, Baltimore, 1892; member of the Medical and Chirurgical Faculty of Maryland; aged 68; died, March 12, of chronic myocarditis.

Frank Evans Christopher, Bolinger, Ala.; Louisville (Ky.) Medical College, 1894; member of the Medical Association of the State of Alabama; aged 68; died recently, as the result of an automobile accident.

Charles A. Borey ✪ New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1895; aged 62; died, February 27, in the Hotel Dieu Hospital of adenocarcinoma of the thyroid.

Frank J. Brown, Los Angeles; George Washington University School of Medicine, Washington, D. C., 1908; aged 39; died, March 6, in Orlando, Fla., of arteriosclerosis and coronary sclerosis.

John Benjamin Thielen, New York; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; aged 64; died, February 4, of cerebral hemorrhage and pulmonary edema.

Robert E. McDade, Chicago; Jenner Medical College, Chicago, 1917; member of the Illinois State Medical Society; aged 43; died, March 22, of hemorrhage following a cholecystectomy.

Lynn H. Case, Santa Monica, Calif.; Hahnemann Hospital College of San Francisco, 1900; aged 57; on the staff of the Wilshire Hospital, where he died, February 28, of acute nephritis.

Charles Fletcher Souder, Red Bank, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1892; aged 67; died, February 1, of chronic myocarditis and x-ray burns of the legs.

John E. Standifer, Elk City, Okla. (licensed in Oklahoma under the Act of 1908); member of the Oklahoma State Medical Association; aged 68; died recently of hydronephrosis and pyelitis.

Edwin A. Simonds, Carthage, N. Y.; Hahnemann Medical College and Hospital, Chicago, 1894; for many years health officer of Carthage; aged 75; died, March 2, of angina pectoris.

Martin E. Rudolph, Aurora, Ill.; Rush Medical College, Chicago, 1908; member of the Illinois State Medical Society; aged 32; died, March 29, of suffocation, the result of a fire.

Robert George Anderson, Elyria, Ohio; Trinity Medical College, Toronto, Ont., Canada, 1895; on the staff of the Elyria Memorial Hospital; aged 68; died, March 3, of heart disease.

William Alvin Denson, Chilton, Texas (registered by Texas State Board of Medical Examiners under the Act of 1907); aged 69; died, January 3, of angina pectoris.

Benno Johann Anton Nachtigall ✪ Cleveland; Medizinische Fakultät der Universität Leipzig, Saxony, Germany, 1893; aged 73; died, February 20, of coronary thrombosis.

Edith Leavitt Clarke, Winter Park, Fla.; Boston University School of Medicine, 1885; aged 75; died, March 9, in the Florida Sanitarium, Orlando, of pneumonia.

Porter Douglas Blackburn ✪ St. Louis; Washington University School of Medicine, St. Louis, 1910; aged 32; died, March 12, of hypertension and nephritis.

Dennis Francis O'Connor, Elkton, S. D.; University of Minnesota Medical School, Minneapolis, 1890; aged 70; died, February 12, of dilatation of the heart.

Henry W. Blumenberger, Reifton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1869; aged 85; died, February 27, of senility.

Hugh Park, Niagara Falls, Ont., Canada; University of Toronto Faculty of Medicine, 1875; aged 82; died, February 27, of acute suppurative meningitis.

William Pearson, Fall River, Mass. (licensed in Massachusetts in 1904); aged 82; died, January 19, of cerebral hemorrhage and arteriosclerosis.

Russell Ross Burt, Los Angeles; Rush Medical College, Chicago, 1903; aged 59; died, January 28, in the Hollywood Hospital, of myocarditis.

Robert L. Sears, Whitewright, Texas; University of Louisville (Ky.) Medical Department, 1891; aged 66; died, February 11, of pneumonia.

Henry Mickey Rice, Covina, Calif.; Rush Medical College, Chicago, 1886; aged 91; died, January 22, of bronchopneumonia.

Lewis Morris, New York; Bellevue Hospital Medical College, New York, 1890; aged 74; died, January 10, of lobar pneumonia.

James H. Metton, Hemphill, Texas (licensed in Texas in 1909); aged 76; died, March 9, of diabetes mellitus.

David L. Robbins, Big Springs, Ark. (licensed in Arkansas in 1900); aged 70; died recently of heart disease.

Bureau of Investigation

GERTRUDE NOVA "OBESITY CURE"

Another Dangerous Nostrum of the "Get-Thin-Quick" Type

Gertrude Nova, Inc., sells an alleged obesity cure from Denver, Colo. It appears from material in the files of the Bureau of Investigation that local branches are opened or agents employed, operating in different parts of the country. It seems, too, that the stuff is also handled by agents, who sometimes work direct within the limits of their state and sometimes enlist the help of "beauty parlors" to further the sale of the nostrum.

The Gertrude Nova concern is reported to have been incorporated in 1933 under Colorado laws, with an authorized capital of $50,000. The corporation is said to have taken over the business established individually by Gertrude S. Tenderich in 1928 under the trade name Gertrude Nova. Mrs. Tenderich, as president of the concern, has associated with her two men who are, respectively, vice-president and secretary-treasurer. It appears that Mrs. Tenderich in 1933 put on the market a sanitary napkin known as "Tampax," now put out by the Tampax Sales Corporation, of which Mrs. Tenderich is said now to be president and the controlling stockholder.

None of the three persons operating this "obesity cure" is a physician, pharmacist or chemist. Of the two gentlemen who are connected with Mrs. Tenderich, one is said to have been employed previously in various lines as a salesman, while the other is a lawyer. This department of THE JOURNAL has repeatedly called attention to the fact that while many "patent medicine" concerns, although exploiting substances of a medical character, have no physicians or pharmacists connected with them, they very frequently do have a lawyer occupying an important place in the organization. The reason is, presumably, that it is much more important, from the nostrum exploiter's point of view, to know how to keep within the letter of the law than it is to know anything about drugs and their actions.

The advertising ballyhoo that accompanies the exploitation of Gertrude Nova's "obesity cure" is to the effect that a noted German physician (name not given), while visiting some friends of one E. G. Kathan, alleged to be a druggist of Trenton, Mo., prescribed an obesity treatment for a member of the Kathan family. The results were alleged to be so marvelous that Mr. Kathan began selling it, and the sale developed to such an extent that he had to conduct the sale of this nostrum as a separate business. More than ten years ago the stuff was sold from Kansas City, Mo., under the somewhat imposing trade name "American Research Institute" and the product was called, variously, "Kathan's Scientific Treatment for Obesity" and "Kathan's Improved Flesh Reducer." One E. E. Pratt was then in charge of this concern. Later the business seems to have been transferred to Denver, to be operated under the name of Gertrude Nova.

The claims made for the "Gertrude Nova Flesh Reducer" are quite typical of obesity-cure "patent medicines." The overweight are told that it is unnecessary to diet, that they need not exercise, and that the product "improves health" and is "absolutely harmless." These are the claims in the "come-on" literature. When the money has gone over the counter, however, the overweight customer is told that the "enemies of a fat person" are fat meats, sugar, bread, cereals, nuts, butter, bacon, cream, candies, olive oil, rich desserts and pastries. She is told, also, to "try to eat only one starch at a meal" and "to get in a walk every day." Further, the overweight woman is told that she should keep up this diet and continue taking the Nova nostrum continuously for three months, and that "many men and women find that its continued use for a somewhat longer period insures good health and maintenance of normal weight."

In February, 1933, some cursory tests were made of this nostrum in the A. M. A. Chemical Laboratory. At that time the product came in two capsules, one containing a dark yellow substance and the other a light yellow substance. The chemists reported that the drugs in the dark capsule were apparently asafetida and calomel. The contents of the light-colored capsule seemed to be essentially desiccated thyroid, with traces of a powdered leaf drug suggestive of digitalis.

In February, 1933, also, Dr. Pinkham, Secretary-Treasurer of the Board of Medical Examiners of California, sent the Bureau of Investigation a copy of a letter that he had received from Mr. J. W. Davidson, a special agent for the Board and a man who has done much to hamper the activities of quacks in California. A Mrs. Martha Schaefer was at that time the San Francisco distributor of the Gertrude Nova nostrum, known as "Kathan's Original Flesh Reducer." Mr. Davidson stated that it had been claimed that the nostrum was prepared for them by Parke, Davis and Company of Detroit and that it contained no thyroid or other harmful substances!

Recently Mr. Davidson submitted to the Public Health department samples of the Gertrude Nova reducer and also the supplementary nostrum "Novar." Shortly thereafter Dr. J. C. Geiger, Director of Public Health of San Francisco, furnished the Board of Medical Examiners with the laboratory report on the Gertrude Nova "patent medicines," "Reducer" and "Novar." According to this report, the "obesity cure" consisted of two capsules, one gray and one brown, the former responding to tests for thyroid and the latter to tests for laxatives, probably of the cascara and aloes type. The supplementary nostrum Novar was reported to contain phenolphthalein and psyllium seed.

On March 25, 1935, it was reported that Inspector J. A. Bentley of the State Board of Pharmacy of California served an official notice on Martha Schaefer as exploiter of the Gertrude Nova nostrum that this "patent medicine" could no longer be sold unless it was dispensed by a licensed pharmacist under the written instructions of a licensed physician! It would be well if other communities could protect their citizens in a similar way.

From the foregoing, it appears, therefore, that the Gertrude Nova "obesity cure" is another one of the potentially harmful thyroid preparations. It is not surprising, therefore, that an Illinois physician has reported that one of his patients who had been taking this nostrum had "become quite nervous," or that a Kansas physician should have stated that the preparation "produced an acute thyrotoxicosis." A Nebraska physician also wrote that women in that section who had taken the Nova "patent medicine" had noticed "a very marked depression" while a physician in Colorado reported that a patient who had taken a number of the Nova capsules "developed a severe colitis with cramping and irritation of the kidneys." Still another physician, in California, reported recently that a woman who had used the Nova preparation for about a month "developed paresthesias, numbness and tingling of the left hand, which grew progressively worse," as well as other untoward effects.

It has been repeatedly emphasized in this department of THE JOURNAL that freak diets and the indiscriminate sale of drugs for the alleged cure of obesity are pernicious and a menace to the public health. Especially dangerous are those anti-fat "patent medicines" that depend mainly, for their action, on metabolic stimulants such as thyroid substance or dinitrophenol.

Correspondence

GIFT FORM FOR HOSPITALS

To the Editor:—Readers of THE JOURNAL may be interested in a simple plan that has been in use at the Sansum Clinic for the past two years not only to interest an increasing number of patients in medical research problems but also to increase the much needed income for this purpose. We call it "Our Birthday Better Health Plan."

During the depression the income from regular sources for the maintenance of research work has been materially reduced but every effort is being made to permit it to be continued. To help maintain this research work we have initiated a simple plan, which is receiving favorable response. We invite our patients who have been aided by the results of medical research with which they are familiar to contribute one dollar on each birthday anniversary. Although modest in amount, such contributions have provided us with considerable money.

My Birthday Present to Medical Research

Because I am grateful for research work which has served my life . . . . ☐

Because my health has been improved by research work . . . . . ☐

I am sending you ONE DOLLAR *for this year's birthday present.*
I hope I can do the same each year.

Birthday _____

Signed _____

Address _____

Form of card for gifts.

We have thousands of diabetic patients who know that they are either alive or better because of research work on insulin and modernized diets.

W. D. SANSUM, M.D., Santa Barbara, Calif.

HEAT STROKE AT BOULDER DAM

To the Editor:—During the last few months I have read several articles referring to heat prostration at Boulder Dam, also the prevention of sunstroke among the men employed by the liberal use of salt and an adequate supply of drinking water. I have been connected with the work at Boulder Dam since the beginning and it seems to me that other factors must be taken into consideration besides merely the prevention as mentioned.

Boulder Dam was begun before any adequate facilities were available to house or feed the men. Many of the men were quartered at bunk houses at the river camp, which was approximately 1,200 feet lower in elevation than Boulder City. The bunkhouses consisted of one large room filled with cots, in which 150 or 200 men were quartered. There was no air conditioning in those days. Water was hauled from Las Vegas and often allowed to remain in milk cans and tanks for several days before it was used, or, largely, the Colorado River was merely allowed to settle a while and then drunk. There was a terrific amount of diarrhea that summer and practically every sunstroke patient had diarrhea. It was impossible to refrigerate the food properly under the existing conditions. The milk served the men was often sour.

The summer of 1931 was by far the hottest that has been encountered during the building of the dam. During July, the month the most sunstrokes occurred, the temperature in

Las Vegas reached 120 practically every day and it averaged about 10 degrees hotter in the bottom of the canyon. The worst part of the construction was under way—the driving of the diversion tunnels—and this was done without proper ventilation and with the fumes of powder smoke and gasoline trucks present.

Examinations were not done on the men before they were employed until the latter part of the summer, and as a result many physically unfit men were employed. These were the ones most susceptible to heat prostration.

The summer of 1931 was the first that any cases of heat prostration were ever recorded in Las Vegas and there were several that summer.

We were using intravenous saline therapy in the cases of sunstroke at that time in the Las Vegas Hospital and it worked well in the cases in which removal to the hospital was done before the lapse of several hours after the onset of symptoms. Las Vegas is about 33 miles away from the dam and as the men had to be transported in ambulances it was not always convenient to bring them to the hospital as soon as they should have been.

The Harvard commission was here during the summer of 1932 to study sunstroke and the effect of extreme heat on workmen and there was no sunstroke with the characteristic temperature ranging to 110 or 112. There were merely some very mild prostrations with muscular cramps. They however recommended the use of salt in the drinking water and this was done in the summer of 1933 and the following summer.

It seems to me that the secret of the high number of cases encountered in 1931 is primarily the terrific temperatures encountered, with poor food, poor water, poor housing facilities with resulting lack of sleep, lack of physical examinations, and the epidemic of diarrhea as secondary factors. The last might have had considerable to do with the dehydration in some of the cases.

J. R. McDANIEL JR., M.D., Las Vegas, Nevada.

"PSYCHOLOGIC CONCOMITANTS OF PAIN"

To the Editor:—Apropos of the last paragraph in the editorial "Psychologic Concomitants of Pain" (THE JOURNAL, February 9, p. 476) beginning "There are no words in English, Critchley says, to signify the state of mind that follows the cessation of a severe or protracted painful experience," you will be interested to know that Beethoven felt in such accord with this statement that he expressed it musically. He fell sick during the composition of opus 132 (one of his last compositions) and on recovery inserted into the work the strangely beautiful "Heilige Danksang." He felt that "convalescence" was such a mysterious sensation that it could not be expressed in the conventional musical forms so reverted to "die Lydischen Mode." These facts are conspicuously featured in Aldous Huxley's "Point Counterpoint."

ISABELLA H. PERRY, M.D., San Francisco.

SENSITIVITY TO CODEINE

To the Editor:—In THE JOURNAL, March 24, 1934, page 908, was an article by Drs. Scheer and Keil reporting a case of hypersensitiveness to codeine and stating that there were only seven proved cases on record. Since then I have seen no new reports, so I am reporting a case of mine which I think is a proved case. It made no impression on me at that time as I did not know that the condition was so rare, but the circumstances leading up to it did make a lasting impression. About eighteen years ago my brother-in-law, about 30 years old, was assisting with preparations for a wedding and was taken with a severe pain in his abdomen and applied to me for temporary relief. I gave him one-fourth grain (0.016 Gm.) of codeine, which relieved the pain but within a short time caused pruritus and a generalized eruption so severe that he could not attend the wedding. This lasted for about twenty-four hours and cleared up. About two years later he again asked for relief from some pain and I gave him one-fourth grain of codeine, with a repetition of his former experience. I have been unable to get him to take another dose of codeine, but he told me recently that a dose of morphine given at the time of an operation caused the same condition.

CHARLES W. HAIDEN, M.D., Evington, Va.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

VACCINATION AGAINST WHOOPING COUGH

To the Editor:—I would appreciate your opinion on whooping cough vaccination. Would you use the Sauer method or that described by Krueger, Nichols and Frawley? Is it feasible to use the latter in the active as well as the prophylactic treatment for pertussis? Is it as yet known how long this immunization lasts? How can I proceed to test the serum titer for immunization after inoculation is completed? How is the Frawley serum given, subcutaneously or intramuscularly, and how long should it take for immunity to develop? Would you recommend the vaccine of Eli Lilly & Co. or of Parke, Davis & Co.? Please omit name.

M.D., Massachusetts.

ANSWER.—Regarding whooping cough vaccination, there are three distinct phases: (1) the treatment by vaccines after the disease has developed, (2) the modification or prevention of the disease in those recently exposed, and (3) the active immunization of those children not exposed. The most controversy centers about the first two. It is generally acknowledged that vaccine has but little effect in the paroxysmal stage of pertussis. Many hold it to be of value in the early catarrhal stage. The majority of those who favor it recommend it after exposure and before symptoms develop. The results obtained are difficult to evaluate because of the lack of controls, but this lack of absolute proof of its efficacy is not a sufficient reason for a conscientious physician not using it. The most favorable and best controlled clinical observations are those of Madsen in the epidemics in the Faroe Islands. In the second epidemic the mortality was thirty times greater and there were sixteen times as many severe cases in the nonvaccinated group. Even with no other evidence, these reports of Madsen would justify the use of pertussis vaccine, partly to prevent the disease but especially to reduce the mortality and decrease the severity.

Frawley, Nichols and Krueger and others have developed a method by which the outer coating of Haemophilus pertussis is crushed and demolished. The soluble endo-antigen that is obtained is stated theoretically to have greater antigenic value, but it must yet be subjected to rigid clinical tests. Their conclusions indicate that the antigen has considerable merit both as a prophylactic and as a therapeutic measure in the treatment of pertussis. Its prophylactic value was mainly in causing very mild attacks in those in whom pertussis afterward did develop. Several careful investigators have since confirmed their work. Aldrich, beginning with 0.5 cc. of antigen, administered two more doses of 1 cc. on alternate days thereafter and states that, although the prophylactic effect is more uncertain, the antigen apparently has the definite effect of modifying and shortening a majority of pertussis infections. This fact is particularly true when the antigen is given early in the attack or before the onset of the cough. Nichols advises giving an initial dose of 0.25 cc., following with injections daily (if possible) or at least every other day of 0.5, 0.75 and finally 1 cc.

Madsen, however, reports just as favorable results with the vaccine but insists, as does Sauer, that it be made from young recently cultivated strains grown on blood agar and that the dose be large (vaccine contains 10 billion bacilli per cubic centimeter; 22 billion were given, divided into three doses). A number of nationally known pediatricians have used the Sauer vaccine, after exposure to the disease, and have concluded that, whereas they may not have been able to prevent the onset of whooping cough, the disease has been modified materially.

Certainly enough evidence has been produced to warrant giving pertussis vaccine or the antigen in nonimmune children between

the time of exposure and the onset of symptoms, in an attempt to prevent whooping cough or at least to decrease its severity.

Regarding the third consideration—the active relatively permanent immunization of those children not yet exposed to whooping cough—most experience concerns the use of the Sauer vaccine. He was the first to attempt this with apparent success. Sauer prepares his vaccine largely according to Madsen and the Danish State Serum Institute specifications, the principal difference being that he uses human blood for his blood agar plates. The total of from 7 to 8 cc. (from 70 to 80 billion bacilli) is divided into three weekly (bilateral) injections of 1, 1.5 and 1.5 cc. respectively. Active immunity is completed in four months and lasts for years. The best age for immunization is the second half year of life. More observations on larger numbers of children over longer periods of time by independent observers are required to confirm this work, but enough evidence has been presented to justify the physician in carrying out this procedure in preventive medicine. Dr. Sauer recommends his vaccine only for permanent immunization. Both Madsen and Sauer stress the importance of stringent care in the preparation of the vaccine and large doses. Sauer strongly advises keeping it cold in a refrigerator and not carrying it around in one's bag for several days.

All injections are given subcutaneously.

Regarding the titer, Huenekens, Toomey, Madsen and others were able to demonstrate that pertussis vaccine produces specific immune bodies, as shown by the complement fixation test. The only method of demonstrating immunity serologically is by the height of the complement fixation titer.

The technic of determining the complement fixation titer, the only known method of measuring the antibody content in those immunized against pertussis, is a complicated procedure, which can be performed only in a well equipped serologic laboratory and is not practical for ordinary clinical use. Details may be found in an article by J. J. Miller Jr. (*J. Immunol.* **28**:247 [April] 1934).

The Council on Pharmacy and Chemistry has deferred consideration of pertussis vaccine (Sauer) until more convincing evidence becomes available (The Journal, March 9, p. 834).

ASTHMATIC ATTACK AFTER PERMANENT WAVE

To the Editor:—I have recently seen a case of asthma that developed following a permanent wave. The materials used on the hair were Luxor oil solution and Minute Mix wave set solution. I understand that the former solution is some bland oil and ammonia; the latter, I believe, is gum arabic and alcohol. I would appreciate it if you would inform me what these solutions contain and if cases of asthma have been reported following the use of them. Are there cases of gum arabic allergy? Any information that you can give me will be appreciated. Please omit name.

M.D., Arizona.

Answer.—Because of carefully guarded trade secrets and because the Food and Drugs Act does not include cosmetics, it is next to impossible to find out what the constituents of specified brands of materials are. However, it is generally known what the usual ingredients are in such cosmetics. For dry shampoos, orris root or lycopodium is customarily employed. Allergic reactions have occurred with both. For the purpose of setting the hair after the process of waving, emulsions of various gums such as the gum of flaxseed, acacia (gum arabic), gum tragacanth, gum of quince seed, and Karaya gum (Indian gum) are commonly used. In addition, the following ingredients are used in the manufacture of hair fixers: boric acid, alkali carbonates, alcoholic keratin, perfume, petrolatum, and also several varieties of waxes.

Instances of asthma and vasomotor rhinitis to flaxseed preparations are fairly frequent. As far as we know there have been no cases reported of allergy to acacia in waving fluids; however, there are probably a number of such unsuspected instances. Two case reports dealing with acacia allergy are to be found in recent literature. One (Maytum, C. K., and Magath, T. B.: Sensitivity to Acacia, *Proc. Staff Meet., Mayo Clin.* **7**:216 [April 13] 1932) deals with an allergic reaction in a woman at the beginning of her second intravenous injection of a solution of acacia. The other paper tells of an instance of asthma in a man who was exposed to acacia dust in a candy factory (Spielman, A. D., and Baldwin, H. S.: Atopy to Acacia, The Journal, Aug. 5, 1933, p. 444). Recently there has been reported a case of vasomotor rhinitis due to the use of Karaya gum solution in the hair (Bullen, S. S.: Perennial Hay Fever from Indian Gum, *J. Allergy* **5**:484 [July] 1934). A similar instance of asthma due to Karaya gum hair waving fluid has been reported. There are probably many more instances of this kind.

It is to be borne in mind that many of these gums, especially acacia and Karaya gum, are used in considerable amounts for other purposes, such as demulcents, hand lotions, in the making of lozenges, troches, "chewy" candy, calico printing and for laxative purposes. Exposure in an allergic individual may occur also from such and other sources.

If possible, the patient should be tested with the various substances mentioned. It may also be possible to find out the nature of the suspected material by testing it on a known patient. There have been several instances of flaxseed allergy.

TOXICITY OF CINCHOPHEN

To the Editor:—1. In view of the recent warnings about the toxicity of cinchophen preparations, what is the consensus as to its indications, contraindications and dosage, average and maximum, in cases of gout? 2. In a specific case, my patient is a man, aged 63. He has typical gouty attacks, which have recently come with increasing frequency, involve singly either of the great toe joints or knee joints, last from a few days to one week, and disappear. Between attacks the blood uric acid readings have been 8 and 6 mg. per hundred cubic centimeters respectively before and after the use of purine-free diets. The rest of the blood chemistry is normal. There have been no gouty tophi discovered at any time. The only other changes of note are a blood pressure of 160 systolic and 110 diastolic and a fixed specific gravity of the urine, as shown by a Mosenthal test to be from 1.016 to 1.018, coupled with a history of nocturia. What dosage of cinchophen is warranted during the attacks? Is the high uric acid between attacks an indication for giving cinchophen during these periods? If so, in what dosage? 3. Moreover, in view of the warnings in recent literature, might the use of cinchophen followed by toxemia and death have any medicolegal aspects? Kindly omit name.

M.D., New Jersey.

Answer.—1. New and Nonofficial Remedies, 1935, states that while the ordinary doses of cinchophen are usually harmless they are occasionally followed by severe and even fatal effects, which are more frequent with the larger doses. Excessive doses or the long continued use of moderate amounts may cause damage to the kidney and occasionally give rise to acute yellow atrophy or to dangerous or fatal hepatitis, usually characterized by the late and relatively abrupt onset of symptoms, the most frequent being jaundice. Fewer cases of poisoning have been reported after neocinchophen, but the relative danger of these two substances has not been determined satisfactorily. The average dose of neocinchophen is 0.3 Gm., which may be given every two to four hours, as required for relief of pain: although, in the treatment of rheumatic fever, when used as a succedaneum of salicylate, it has been given in a dosage as high as 1 Gm. every hour until relief has been secured. The appearance of a skin eruption should prompt its immediate discontinuance. In any case it should not be given continuously but in brief courses with longer intervals to secure complete elimination.

2. In gout the use of neocinchophen is justified in doses of 0.5 Gm. from four to six times daily. It makes the kidney more permeable to uric acid, so that more uric acid is excreted and less is found in the blood. Its greatest effect on uric acid elimination is reached in one day. It should be discontinued after the second day, as it does not "mobilize" uric acid in any sense of the word. It has its best use in gout when employed between attacks in courses of two days each. Given this way, it might abort threatened attacks. During an attack it should not be given, as uric acid is then being eliminated as rapidly as is possible.

3. When he gives it with proper precautions, the physician carries no more liability in the prescribing of this than he does of any other potent agent.

SPLENOMEGALY

To the Editor:—I am interested in a 3 year old boy who was suffering from severe rickets when I first examined him three months ago. He had bony changes of marked degree in the skull and chest. There was a pot-belly, with enlargement of the liver and spleen. He also suffered from repeated attacks of gastro-intestinal irritation accompanied by fever. This condition had been present for more than a year, with lack of a persistent plan of treatment. Under viosterol and ultraviolet therapy the gastro-intestinal symptoms have cleared up and his general health has improved considerably. The liver has diminished in size to almost normal proportions. The spleen remains enlarged. His skin is tough and scaly and the quartz light therapy has been discontinued. Can you venture an opinion on these facts as to the splenomegaly? Will it recede to normal size in time? I believe that a blood dyscrasia has been ruled out by a blood count. The Wassermann reaction is negative. How long should viosterol or cod liver oil be continued in such a case? Please omit name and address.

M.D., Pennsylvania.

Answer.—The question of enlargement of the spleen in rickets has been debated by clinicians for years. The fact that splenomegaly may occur in a rachitic infant has been used by some European clinicians to support the toxic or bacterial theory of the etiology of rickets. Various authorities give the incidence of splenic enlargement in rickets in variable figures. These vary from 20 to 70 per cent. The late Alfred Hess collected some valuable clinical data on this point some years ago. He found that in a large series of infants with negative

Wassermann reactions the spleen was palpable in 20 per cent of those who gave no evidence of rickets and in 25 per cent of those who were rachitic. Starck corroborated these observations pathologically. This investigator noted the size and condition of the spleen in 113 necropsies of young children who died from various causes. The spleen was found to be enlarged in 60 per cent of the rachitic cases and in 50 per cent of non-rachitic cases. Unfortunately there are no accurate scientific data on the cause of the splenomegaly. The fact that it does not recede on antirachitic therapy throws considerable doubt on the rachitic etiology. The consensus is that enlargement of the spleen in rickets is the result of infection or, at any rate, secondary to it. Clinical experience has shown that such spleens gradually recede to normal size with general treatment. However, the time required for this change may be a matter of years. Such a case should receive careful consideration as to other causes of splenomegaly. Cod liver oil or viosterol should be continued in therapeutic doses until roentgenographic and blood chemistry observations are normal. From this time on, prophylactic doses should be continued throughout the period of growth. Splenomegaly should not be used as a criterion for antirachitic therapy.

TREATMENT OF SYPHILIS

To the Editor:—I have a Jewish patient, aged 55, a woman who has presented a four plus Kahn reaction. There have been no distinct clinical symptoms indicating the presence of the disease or to serve as an indicator of the progress of the treatment. To date she has had twenty-four intramuscular injections of a bismuth compound, one course of mercury inunctions, six months of iodides orally, and about ten injections of arsphenamine in doses ranging from 0.2 to 0.6 Gm. Severe reactions and eczema have prevented this medication after several trials. Sodium thiosulphate has been used freely, intravenously and orally. The Kahn reaction now is two plus and she is becoming discouraged. What can I give her to take the place of the arsenic preparation that may speed a cure? I will appreciate any suggestions in handling the entire course of the case. M.D., Florida.

ANSWER.—There appears to be no reason for discouragement on the part of this patient. It is the doctor who should be discouraged from attempting to "cure" a disease of many years standing by too heroic treatment. In a woman of 55, intensive arsenical treatment may be far more dangerous than a persistent positive Kahn test. Patients can live many years with a positive serologic test without impaired usefulness. Intermittent treatment with courses of bismuth compounds and iodides may ultimately bring about a reversal of the Kahn test. Even a negative Kahn test should not be looked on as a criterion of absolute "cure," as the results of postmortem studies (Warthin) have shown. A careful cardiovascular examination and a spinal puncture will give valuable information and should precede any further therapeutic efforts.

DIAGNOSIS OF DERMATITIS

To the Editor:—A white married woman, aged 28, complains of a scattered eruption over her body and face of eight years' duration. The eruptions are more pronounced just before the menses. She also complains of sore breasts just before her periods. The eruption, she states, starts as a small, hard pimple, which gets larger, and a watery secretion is discharged from each pimple, which is very itchy. The patient has very small breasts, a high arched palate and a male hair line. Her height is 5 feet 7 inches (170 cm.); her weight, 151 pounds (68.5 Kg.). Systemic examination is negative. She has a pelvic-girdle obesity. Menstruation started at 14 years. She flows regularly every thirty-two days, for only one day, and only stains. The eruptions are papular and hard, with some induration at the base. The blood chemistry, Wassermann reaction and urinalysis are negative. Basal metabolism has been minus 18 on three different tests. The vaginal examination reveals a small uterus, not infantile; the ovaries are not palpable. She was treated with thyroid and pituitary with no results in weight, eruption or menses. She was treated with antuitrin-S and theelin for three months. The menses increased to three days and in amount. Soreness of the breasts was absent and no weight loss was noted. The eruptions are the same. This is the most annoying symptom. I am at a loss to make a diagnosis as to the skin condition. If possible, kindly give me a diagnosis and suggest treatment. Kindly omit name. M.D., Rhode Island.

ANSWER.—It is impossible to make a dermatologic diagnosis from the description given. In view of the definite evidence of endocrine disturbance, the dermatitis might be of endocrine origin, such as, for instance, a dermatitis dysmenorrheica (Polland-Matzenauer). If an endocrine disturbance is causally related to the dermatosis, the effort at correcting this underlying condition should be persisted in. However, the dermatitis described could well be completely unrelated to the menstrual and hormone disturbances and in this event many possible diagnoses are to be considered. The first and foremost seems to be either a drug eruption or a dermatitis from external contact. Absolutely all drugs should be stopped for at least two months. Even the question of eliminating iodized salt from the table and kitchen should be carefully gone into. The search for possible external irritants should be carried out by means of the patch test, the technic of which may be found in the article on the contact or patch test in dermatology by Drs. Marion B. Sulzberger and Fred Wise in the *Archives of Dermatology and Syphilology* 23:519 (March) 1931. Locally the two following may be tried:

1. Menthol 0.25 per cent; phenol 1 per cent; coal tar solution 10 per cent in calamine lotion with zinc oxide.
2. Menthol 0.25; naftalan 10 per cent in Lassar's paste.

ALCOHOL IN PEPTIC ULCER

To the Editor:—What clinical evidence exists that alcohol, such as a highball, or whisky well diluted with water, or beer is harmful to ulcer patients? Kindly do not publish name. M.D., Georgia.

ANSWER.—It is generally conceded that alcohol in any form should not be taken by patients with peptic ulcer. Alcohol is an irritant to the gastric and duodenal mucosa. Hurst and Stewart (Gastric and Duodenal Ulcer, New York, Oxford University Press, p. 422) state that while light wines or well diluted whisky may be taken with meals after the patient is free from symptoms for several months, cocktails, whisky, champagne and other effervescent alcoholic drinks must be prohibited. Furthermore, 7 per cent alcohol in water is one of the test meals in use for the determination of gastric acidity because of the well known ability of alcohol to stimulate acid secretion. Edward L. Kellogg (The Duodenum, New York, Paul B. Hoeber, Inc., 1933, p. 540) states that the abuse of alcohol, among other factors, may lead to the recurrence of an ulcer.

MERALGIA PARAESTHETICA

To the Editor:—A boy, aged 11 years, who has been under my care a short time, has suffered since he was 5 from a painful area on the outer side of the left thigh, about 2½ inches above the knee joint. This area of tenderness is about 2½ inches long and 1½ inches wide. It is not inflammatory. There is no trouble with the deeper bone or soft parts. There are no apparent pathologic changes. The area referred to is exceedingly sensitive, the clothing rubbing on it causing pain. A mere touch will cause excruciating pain. It gives him lots of trouble in school. My diagnosis is meralgia paraesthetica, or Roth's disease. The anterior crural nerve on that side seems tender. The tonsils have been removed. They were not normal. All organs have been examined. Kindly give your opinion as to diagnosis and treatment. Please use initials only. M.D., California.

ANSWER.—The area described corresponds with the usual site of meralgia paraesthetica in the distribution of the external cutaneous femoral nerve. The causes are usually traumatic or toxic. Search should be made for causes of pressure on the nerve, including tight clothing and suspenders. Among toxic causes, in addition to sources of focal infection, the possibility of lead intoxication should be considered. These, of course, presuppose that such conditions as disease of the vertebrae and spina bifida have been excluded. Therapeutic measures other than removal of an established cause include the use of mild galvanism, local applications of heat, and such measures as diathermy, though in chronic cases they may not accomplish much. The condition is not serious in itself, but the pain and incapacity may be so severe as to justify section of the cutaneous nerve involved.

EOSINOPHILIA IN BRONCHIAL ASTHMA

To the Editor:—Would you kindly give me the latest data on the significance of eosinophilia in connection with bronchial disturbance? Has any treatment been suggested in connection with the high eosinophil count? IVOR G. CLARK, M.D., Columbus, Ohio.

ANSWER.—Eosinophilia, or an increase in the number of polymorphonuclear eosinophils in the blood above 4 per cent, has many causes. The most common causes are (1) trichiniasis, (2) allergic conditions, (3) bronchial asthma, (4) intestinal parasites, (5) skin diseases, especially urticaria, psoriasis, pemphigus and arsenical dermatitis, (6) scarlet fever, (7) bone marrow diseases, especially myelogenous leukemia, metastases, tuberculosis or osteomyelitis, (8) Hodgkin's disease, (9) liver therapy and (10) familial conditions.

It is probable that all the causes of eosinophilia except the group due to bone marrow involvement belong to the series of allergic conditions. For instance, it is found in bronchial asthma, hay fever, urticaria, angioneurotic edema, serum sickness, and after the injection of vaccines and various foreign proteins.

In true allergic bronchial asthma, eosinophils are found in large numbers in the sputum as well as in the blood. Eosinophilia does not occur in cardiac asthma and is therefore of differential value. Eosinophils are found in the conjunctival smears in hay fever and in the skin, lymph nodes and internal organs in various allergic states.

The presence of an eosinophilia in a bronchial disturbance therefore speaks for a true bronchial asthma, when intestinal parasites and bone marrow diseases can be excluded. The eosinophilia does not require treatment, as it is most probably evidence of some defensive reaction to a foreign protein or chemical substance. Removal of the exciting agent (pollen, food, arsenic, camphor, parasites) will cause the eosinophilia to disappear, except in the rare cases of familial eosinophilia of unknown cause.

BONE UNION BY BONE CEMENT

To the Editor:—May I ask you kindly to supply me with information on the subject of bone union by means of bone cement, or bone glue or any other substance to be inserted or injected between bone fragments, for the purpose of uniting these. I am not interested in transplants or fixation of fractured bone. Kindly inform me of any existing literature pertaining to this subject, whether it has been in clinical use or in the form of research. Kindly omit name.

M.D., California.

ANSWER.—The correspondent imposes severe limitations on the answer. Exclusive of the transplantation of bone or fixation of fractured bone, one might say that all methods are still practically in the experimental stage.

These methods include those grouped as chemical and those called organic. The chemical ones include the addition of some combination of calcium and phosphorus, such as dicalcium phosphate or tricalcium phosphate. This method has been used by Clay Ray Murray of New York and by Farrell at the New York Orthopaedic Hospital.

The organic methods include bone dust and bone paste. Bone drilling such as that designed by Beck of Kiel and popularized by Böhler should be mentioned in this connection; that is, multiple drill holes are made across the area of delayed union in order to stimulate circulation and to produce avenues for the passage of osteogenic elements.

The correspondent may be interested in the following two articles:

Jones, R. W.: The Inadequate Immobilization and Nonunion of Fractures, *Brit. M. J.* 1: 936 (May 26) 1934.

Jones, R. W., and Roberts, R. E.: Calcification, Decalcification and Ossification, *Brit. J. Radiol.* 7: 321 (June), 391 (July) 1934.

IRIDOTASIS AND IRIDENCLEISIS

To the Editor:—In THE JOURNAL, January 26, page 341, is given a somewhat incorrect answer to a correspondent who inquires concerning the derivation of the terms iridotasis and iridencleisis. The second element of each word, being very unusual in medical terminology, might well be expected to lead a busy physician or editor, who has no leisure for furbishing his Greek, to philosophize a little, as many of us are tempted to do in the absence of exact information. Since the former word is neither "a simplification" nor a "corruption," and since the origin of the latter is (despite your cautious assertion to the contrary) perfectly clear, I will venture to establish their legitimacy. Both are modern formations sired by respectable, though little known, Greek words, properly united, and are appropriate to the operations they were designed to describe.

Iridotasis is a compound of *irido-*, which is the combining form of ἶρις, iris, plus τάσις, stretching (from τείνω, to stretch). The element *-tasis* has nothing to do with the *-desis* of *iridodesis*, though the operations intended by *iridotasis* and *iridodesis* are similar. The origin of the second element of the latter is to be found in δέσις, binding (*from* δέω, to bind). In view of frequently heard mispronunciations it is worth mentioning that these words should be uttered with the stress on the antepenultimate syllable: *iridot' asis* and *iridod' esis*.

Iridencleisis runs parallel in its formation. The first element is the same except for the *-o-*, which is needed only before a consonant. The second element is itself compounded from two words: ἐν, in, and κλεῖσις, to shut or lock. The meaning, therefore, is "a locking in of the iris," whereas the other terms mean respectively "a stretching of the iris" and "a binding of the iris." Once again attention should be directed to the stress: *iridencleĭ' sis*. The *ei* is sounded as in *height*.

It may be of interest to your correspondent and other readers to know that the term *iridencleisis* can be traced back to Sir William Adams, who used it in 1812 to designate his operation for making an artificial pupil. George Critchett of London in 1857 introduced the erroneously compounded term *iridodesis* (corrected to *iridodesis* by later writers, who respected the Greeks' way of combining Greek words) for his glaucoma operation. In 1906 S. Holth of Christiania, Norway, proposed another glaucoma operation, which he called *iridencleisis antiglaucomatosa*, and shortly afterward Johan Borthen of Bergen, Norway, described his *iridotasis antiglaucomatosa*. In the *Archiv für Augenheilkunde* 68: 145, 1911, Borthen gives the derivation of his newly coined term.

HARRY K. MESSENGER, M.D., Boston.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Final oral and clinical examination (Group A and Group B candidates).* Atlantic City, N. J., June 10-11. *Application lists close May 1.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 8, and New York, June 10. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Atlantic City, N. J., June 10, and St. Louis, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Philadelphia, June 7-8. Sec., Dr. Walter Freeman, 1726 Eye St. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: San Francisco, May 10-12, and Atlantic City, N. J., June 8-10. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

ARKANSAS: *Basic Science.* Little Rock, May 6. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Regular.* Little Rock, May 14. Sec., Dr. A. S. Buchanan, Prescott. *Eclectic.* Little Rock, May 14. Sec., Dr. L. L. Marshall, 820 W. 14th St., Little Rock.

CALIFORNIA: *Reciprocity.* San Francisco, May 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

IOWA: Iowa City, June 4-6. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KENTUCKY: Louisville, June 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 332 W. Main St., Louisville.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in all centers where there are Class A medical schools and five or more candidates desiring to take the examination, June 24-26 and Sept. 16-18. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: *Basic Science.* Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, May 6. Sec., Dr. Edward E. Hamer, Carson City.

OHIO: Columbus, June 4-7. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: *Basic Science.* Portland, May 18. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

WYOMING: Cheyenne, June 3. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne.

New York September Examination

Mr. Herbert J. Hamilton, chief, Professional Examinations Bureau, reports the written examination held by the New York State Board of Medical Examiners in Albany, Buffalo, New York and Syracuse, Sept. 24-27, 1934. The examination covered 9 subjects. An average of 75 per cent was required to pass. Two hundred and seventy-one candidates were examined, 205 of whom passed and 66 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of California Medical School		(1934, 2)	2
Yale University School of Medicine		(1934)	1
George Washington Univ. School of Medicine	(1933, 3),	(1934, 8)	11
Georgetown Univ. Sch. of Med.	(1931),	(1932), (1933), (1934, 4)	7
Howard University College of Medicine		(1933), (1934)	2
University of Georgia School of Medicine		(1930), (1932)	2
Loyola University School of Medicine		(1933), (1934)	2
Northwestern University Medical School		(1934)	1
Rush Medical College		(1934, 4)	4
University of Illinois College of Medicine		(1934)	1
University of Louisville School of Medicine		(1926), (1933)	2
Louisiana State University Medical Center		(1934)	1
Tulane Univ. of Louisiana School of Medicine		(1928), (1933)	2
University of Maryland School of Medicine and College of Physicians and Surgeons		(1934)	2
Boston University School of Medicine		(1931), (1934, 3)	4
Harvard University Medical School		(1934)	1
Tufts College Medical School		(1933, 2)	2
University of Michigan Medical School		(1933), (1934)	2
St. Louis University School of Medicine		(1933), (1934)	2
Washington University School of Medicine		(1931), (1932)	2
Creighton University School of Medicine		(1933), (1934, 8)	9
Albany Medical College		(1933), (1934)	2
Columbia University College of Physicians and Surgeons	(1931, 2), (1932, 5),	(1933, 7), (1934, 7)	21
Cornell University Medical College		(1932, 2), (1934, 4)	6
Long Island College of Medicine	(1932),	(1933, 3), (1934, 14)	18
New York Homeopathic Medical College and Flower Hospital		(1933), (1934, 12)	13
New York University Medical College	(1913),	(1932), (1933, 4), (1934, 4)	10
Syracuse University College of Medicine		(1934, 3)	3
University of Buffalo School of Medicine	(1933),	(1934, 7)	8
University of Rochester School of Medicine		(1933, 2), (1934)	3
University of Oregon Medical School		(1929)	1
Hahnemann Med. College and Hospital of Philadelphia		(1932)	1
Jefferson Med. Col. of Philadelphia	(1931, 2),	(1932), (1934)	4
Univ. of Pennsylvania School of Med.	(1929),	(1933), (1934)	3
Woman's Medical College of Pennsylvania		(1933)	1
Medical College of the State of South Carolina		(1933)	1
Medical College of Virginia		(1934)	1
Queen's University Faculty of Medicine		(1933)	1

Laval University Faculty of Medicine.....(1933) 1
McGill University Faculty of Medicine.....(1932), (1934) 2
Medizinische Fakultät der Universität Wien (1932),* (1934, 2)* 3
Deutsche Universität Medizinische Fakultät, Prag, Austria .....(1929) 1
Universita Komenského Fakulta Lekárska, Bratislava, Czechoslovakia .....(1929) 1
University of Sheffield Faculty of Medicine.....(1932) 1
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg, Germany .....(1930)* 1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin .....(1931)* 1
Hamburgische Universität Medizinische Fakultät, Hamburg, Germany .....(1931)* 1
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main, Germany .....(1933)* 1
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Germany .....(1932, 2)* 2
Ludwig-Maximilians-Universität Medizinische Fakultät, München, Germany .....(1932)* 1
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau, Germany .....(1934, 2)* 2
University of Greifswald Medizinische Fakultät, Germany (1931)* 1
Universität Heidelberg Medizinische Fakultät.....(1932, 2)* 2
Universität Köln Medizinische Fakultät, Germany.....(1931)* 1
Universität Leipzig Medizinische Fakultät, Germany..(1932)* 1
Regia Università di Napoli Facoltà di Medicina e Chirurgia .....(1924) 1
Uniwersytet Jana Kazimierza Wydział Lekarski, Lwów, Poland .....(1926)* 1
University of Aberdeen Faculty of Medicine.....(1933, 5)* 5
University of Edinburgh Faculty of Medicine.....(1932) 1
Licentiate of the Royal College of Physicians and of the Royal College of Surgeons, Edinburgh.....(1934), (1934)* 2
University of St. Andrews, Scotland.....(1934), (1934, 4)* 5
Université de Genève Faculté de Médecine.....(1933, 2)* 2
Osteopaths 6

School	FAILED	Year Grad.	Number Failed
University of Arkansas School of Medicine		(1934)	1
Georgetown University School of Medicine		(1934, 3)	3
Howard University College of Medicine		(1933), (1934)	2
Loyola University School of Medicine		(1934)	1
Rush Medical College		(1930), (1934)	2
University of Illinois College of Medicine		(1934)	1
Johns Hopkins University School of Medicine		(1925)	1
Tufts College Medical School		(1931)	1
Albany Medical College		(1934)	1
Long Island College of Medicine		(1931), (1933)	2
New York Homeopathic Medical College and Flower Hospital		(1928), (1934)	2
New York University, University and Bellevue Hospital Medical College		(1934, 2)	2
Syracuse University College of Medicine		(1934)	1
University of Buffalo School of Medicine		(1934, 2)	2
University of Rochester School of Medicine		(1932), (1934)	2
Hahnemann Medical College and Hospital of Philadelphia		(1933)	1
Woman's Medical College of Pennsylvania		(1933)	1
Dalhousie University Faculty of Medicine		(1933)	1
Queen's University Faculty of Medicine		(1929), (1933), (1934)	3
Univ. of Toronto Faculty of Medicine		(1928), (1931), (1932)	3
Medizinische Fakultät der Universität Wien		(1926), (1934)*	2
Université Catholique de Louvain Faculté de Médecine, Belgium		(1933)	1
Masarykova Universita Fakulta Lékařská, Brno, Cze.		(1928)	1
Université de Paris Faculté de Médecine		(1930)	1
Albertus-Universität Medizinische Fakultät, Königsberg, Germany		(1933)*	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1931)*	1
Universität Köln Medizinische Fakultät, Germany		(1932)	1
Universität Leipzig Medizinische Fakultät, Germany		(1930)	1
Westfälische Wilhelms-Universität Medizinische Fakultat, Münster, Germany		(1931)*	1
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest		(1931),* (1932)*	2
Regia Università degli Studi di Padova Facoltà di Medicina e Chirurgia		(1934)*	1
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1932), (1933)*	2
Regia Università degli Studi di Siena Facoltà di Medicina e Chirurgia		(1932)*	1
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1923), (1931), (1932)	3
University of St. Andrews, Scotland		(1933),* (1934)*	2
Universität Bern Medizinische Fakultät		(1928)	1
Université de Genève Faculté de Médecine		(1933)	1
Osteopaths			10

* Verification of graduation in process.

Ohio December Examination

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports the oral, written and practical examination held in Columbus, Dec. 3-6, 1934. The examination covered 10 subjects and included 80 questions. An average of 75 per cent was required to pass. Thirty-six candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1932)	81.9, (1934) 84.5
Loyola University School of Medicine		(1933)	81.6, (1934) 80.7,* 81.3,* 82.2,* 83.2,* 84*
Northwestern University Medical School		(1929)	80.9, (1930) 83
Boston University School of Medicine		(1933)	79.5
Harvard University Medical School		(1934)	85
New York Homeopathic Medical College and Flower Hospital		(1933)	82.1, (1934) 82, 84.8, 86, 87
University of Rochester School of Medicine		(1934)	82.9
Western Reserve University School of Medicine		(1930)	84.8
Hahnemann Medical College and Hosp. of Philadelphia		(1934)	82.4, 82.9, 83.5
Jefferson Medical College of Philadelphia		(1933)	84.4, (1934) 80.5, 83.8
Temple University School of Medicine		(1933)	75.6, 78.1, (1934) 81.3
Laval University Faculty of Medicine		(1934)	80.2
University of Toronto Faculty of Medicine		(1932)	84.8
Universidad de la Habana Facultad de Medicina y Farmacia		(1928)	78.3
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau, Prussia, Germany		(1925)	84.5,† (1930) 85†
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest		(1926)	75.7
Rijks-Universiteit te Leiden Faculteit der Geneeskunde, Netherlands		(1928)	85.3
Universitatea Regele Ferdinand I-iu din Cluj Facultatea de Medicină şi Farmacie		(1924)	83.5

* This applicant has completed his medical course and will receive his M. D. degree on completion of internship. License withheld.
† Verification of graduation in process.

Book Notices

Aids to Psychiatry. By W. S. Dawson, M.A., M.D., F.R.C.P., Professor of Psychiatry, University of Sydney. Third edition. Cloth. Price, $1.50. Pp. 318. Baltimore: William Wood & Company, 1934.

This little book is one of the few compendiums in psychiatry that are at all adequate. It is interesting to note that in it the neuroses are given proportionately greater space than the more serious mental disorders, an unusual but intelligent balancing of subject matter not usually found even in the larger psychiatric textbooks. The book is reasonably accurate according to conventional psychiatry, for there is nothing even approaching the radical in it. It might well be considered a summary of any of the more acceptable textbooks of psychiatry and so, as a review book, should adequately serve its purpose. The stress that is placed on amentia (feeblemindedness) makes these chapters well worth perusing, even though the psychologic factors in this type of condition are not stressed as much as they would have been had the book been written by an American. The chapter on treatment is short and probably of little value in the actual handling of patients but sufficiently detailed to enable a medical student to gather much theoretical information about the subject. The British terminology and medicolegal materials are used throughout, and the last chapter on case taking is probably too abridged. One who approves of these shortened textbooks will find this volume satisfactory. There is a question, however, whether simply giving a list of definitions without illustrations and without case histories is ever adequate in the training of students in psychiatry. Considering its price and the amount of material in it, it should be sufficiently useful for a psychiatric teacher to have in his library even though he already has the more formal textbooks. For the busy general practitioner, it may contain just the clues he needs in recognizing the various serious mental disorders.

Handbuch der Biochemie des Menschen und der Tiere. Herausgegeben von Prof. Dr. phil. et med. Carl Oppenheimer. Band II: Ergänzungswerk. Ergänzung zu Band IV-VI des Hauptwerkes. Second edition. Paper. Price, 71 marks. Pp. 961, with 41 illustrations. Jena: Gustav Fischer, 1934.

As a supplement to volumes IV-V of the original work, this is a valuable addition, which specialists in the various fields will no doubt welcome. The subdivision of subject matter adopted naturally leads to considerable overlapping in the treatment by the authors. On the whole, the reviews appear to cover quite completely the more important contributions over the period 1925-1932 inclusive. The main divisions adopted are chemistry of tissues and organs, secretion and products of secretion, digestion, absorption and excretion, and nutrition, gas exchange and metabolism.

In the first section, Ludwig Pincussen presents carefully selected citations on general physical chemistry and the organic and the inorganic constituents of the blood. Edgar Wöhlich rather briefly reviews blood coagulation. H. K. Barrenscheen presents blood sugar fully. Wohlgemuth reviews blood enzymes other than the Abderhalden reaction. Wertheimer

covers the latter fully. Gerhartz presents three sections on the chemistry of lymph, the chemistry of transudates and exudates, and the chemistry of the postembryonal organs involved in blood cell formation. R. E. Mark discusses the formation of lymphs. Aron and Klinke have assembled much information on bone, teeth, cartilage and elastic tissue. Stephan Rothman gives a comprehensive review on the skin. Paul Krüger has gathered and organized information concerning supporting tissues from the chemical and developmental points of view. In the discussion of the composition of muscle tissue, Otto Fürth covers proteins, amino acids, simple bases and the physical chemistry of muscle tissue, Karl Lohmann reviews the fats, lipins and carbohydrates, and H. K. Barrenscheen considers the purines. Lohmann and Weicker give a brief review on heart and blood vessels. Pincussen covers the chemistry of lung tissue. Gottschalk reviews the chemistry of tumor, cancer and sarcoma tissue. Kurt Steindorff gives a well organized treatment of the chemistry of the eyeball.

In the second section there are good reviews by Julius Wohlgemuth, Bickel, Theodor Brugsch and Paul Krüger on the chemistry of salivary, gastric, pancreatic and intestinal secretions, and special sections on the liver and bile and digestive glands in the lower forms. Under the general title of sex glands, Gerhartz presents an exceedingly brief treatment of the testicle. Leo Zuntz likewise ignores the hormones in the female sex organs. Paechtner reviews the chemistry of the resting and incubating egg, and Grimmer gives well organized reviews on the mammary gland, milk and milk coagulation.

In the third section, the chemistry of digestion and absorption in invertebrate forms is reviewed by Arthur Scheunert, absorption by Pincussen, the formation and composition of feces by Miss Kozywanek, skin excretion by Rothman, excretion by tears by von Röth, poisonous excretion by T. A. Maass, the action of the kidney under various influences by R. E. Mark, the chemistry of the kidney, of urine and the physical chemical aspects of the latter by Pincussen, the chemistry, origin and amount of amniotic fluid by Leo Zuntz, the gases of the body and their circulation therein by Lehmann, and the acid-base equilibrium by Gollwitzer-Meier.

In the fourth section, Hans Aron and Karl Klinke cover the advances in the general aspects of nutrition, von Wendt briefly reviews the theoretical principles of metabolism, Lehmann reviews two subdivisions, the respiratory and general exchange and the energy exchange in the organism, and Grafe concludes the work with a timely and extensive review on the specific dynamic action. Fortunately an excellent index is included in this extensive supplement.

Jewish Contributions to Medicine in America (1656-1934), with Medical Chronology and Bibliography. By Solomon B. Kagan, M.D. Cloth. Price, $5. Pp. 519, with 69 illustrations. Boston: Boston Medical Publishing Company, 1934.

This book has a delightful foreword by the medical historian Dr. James J. Walsh, together with a preface and introduction by the author. The first chapter is devoted to brief biographies of early colonial Jewish physicians in America, but in the remainder of the book physicians are classified according to their various specialties. In the appendixes the special work of certain physicians is described under the title of "Medical Lights." Then follow a list of Jewish medical institutions and their history, a section on Jewish medical philanthropy, and finally a medical chronology and a bibliography together with dates of persons, names and subjects. The illustrations consist of reproductions of photographs of the respective physicians, but this represents only a small percentage of the many names listed. The biographies are in some instances extensive and in others brief, but the work as a whole gives one a good idea of the great work that has been done in America from colonial days onward, together with the institutions that have been developed. The work is a valuable one from a historian's standpoint, and it should prove useful to any one who is interested in medical history. The accomplishments of many of the American Jewish physicians will be a source of pride to those who are interested in the achievements of their own people and a source of information to every one. There are a number of typographic errors, but these are not sufficient to detract from the value of this timely work.

Body Mechanics in the Study and Treatment of Disease. By Joel E. Goldthwait, M.D., LL.D., Member of Board of Consultants, Massachusetts General Hospital, Lloyd T. Brown, M.D., Instructor Orthopedic Surgery, Harvard Medical School, Loring T. Swaim, M.D., Instructor Orthopedic Surgery, Harvard Medical School, and John G. Kuhns, M.D., Assistant in Orthopedic Surgery, Harvard Medical School. Cloth. Price, $4. Pp. 281, with 99 illustrations. Philadelphia & London: J. B. Lippincott Company, 1934.

In this work some of the leading orthopedic surgeons of the Boston group have combined to present modern views of posture. One finds, however, in the preface the term "chropic patient"—a rather doubtful combination coming from Boston. The book includes sections devoted to the mechanics of the body, to various types of body, and then to disturbances of various systems of the body associated with wrong body mechanics. The final chapters include treatment, illustrative cases, visceral disturbances and references to medical literature. The book is handsomely illustrated with roentgenograms and diagrams, which add greatly to the value of the text. It does much to show how modern orthopedic surgery may be of aid in overcoming many common disturbances of health and also to bring relief in conditions in which body mechanics is usually not considered at all or else in a subsidiary manner. In the concluding paragraph the authors refer to "chronic medicine," meaning no doubt the diagnosis and treatment of chronic diseases. It is a locution that merits correction in future editions of this most useful work.

Notes on Dr. Camp's Lectures in Neurology. Arranged by Dr. L. Himler, Department of Neurology, University of Michigan. Cloth. Price, $3. Pp. 260, with illustrations. Ann Arbor, Michigan: Edwards Bros., Inc., 1934.

This is a small volume produced by the new method of lithoprinting, which makes the text look as though it had been well typewritten. It contains summaries of lectures given in neurology at the University of Michigan and would naturally have the fault of being second-hand material, although one may be sure that Dr. Camp himself must have checked the book before permitting its publication. Except for students at that particular university, it is difficult to see any single group for which this book would be more useful than other short textbooks. The descriptions of diseases are too short, as a rule, to be a substitute for even the smaller standard neurologic textbooks. Some of the more obscure diseases are dealt with in such a way that not even the most elementary signs and symptoms are enumerated. In all probability they should either have been omitted or a little bit more thoroughly discussed. The abridgment of the discussions of the more complicated neurologic entities would make it necessary for the student to hear Dr. Camp's lectures or else supplement this book by a larger textbook in order, for instance, to see what is meant by such symptoms as the Babinski sign, the Argyll Robertson pupil and other signs which are characteristic of specific disorders but which are not fully discussed under those disorders or elsewhere. The first part of the book, dealing with the methods of examination, is too sketchy and hence is misleading to the beginning student of the complex science of neurology. The material in it is not given in any detail and the significance of individual tests, as indicated, is minimized. Nevertheless, besides the unquestionable value of the book to the specific students at whom it is pointed, many neurologists should find it valuable as a systematic outline to use to balance their own lectures. The general practitioner who has a fair groundwork in neurology might find the book valuable for review or for a quick checkup of symptoms, for what material is given is authentic and specific.

A Textbook of Pathology for Nurses. By Coleman B. Rabin, B.S., M.D., Lecturer in Pathology in the Mount Sinai Hospital School of Nursing. Cloth. Price, $1.75. Pp. 343, with 61 illustrations. Philadelphia & London: W. B. Saunders Company, 1934.

This edition represents an improvement in the textbooks of pathology for nurses. Like other books, however, the purpose appears to give pathology in altogether too concise form. Each chapter is supplemented by a series of simple review questions. A notable feature of the volume is the accompanying illustrations and diagrams, in which most books for nurses are lacking. The style is simple and clear. The section on general pathology may be considered adequate, but that on neoplasms is much

too brief. Perhaps undue emphasis is placed on the results of obstruction, to which five chapters are devoted. The second part is devoted to clinical pathology, presented also in illustrated form. Instructors in training schools will find an improvement in this edition largely because of the illustrations.

Symposium on Silicosis. Edited by B. E. Kuechle, Claims Manager, Employers Mutuals, Wausau, Wisconsin. An Unofficial Transcript of the Silicosis Symposium Held in Connection with the Trudeau School of Tuberculosis at Saranac Lake, N. Y., June 18 to 22, 1934. Paper. Price, $3. Pp. 99, with 2 illustrations. Wausau, Wisconsin.: Employers Mutual Liability Insurance Company, 1934.

Because of the great importance the pneumoconiosis and especially the silicosis problem have assumed within the past few years, the Trudeau School of Tuberculosis devoted one week of the regular 1934 course exclusively to silicosis and tuberculosis. The symposium was under the direction of L. U. Gardner. The etiology of silicosis was presented by R. R. Jones of the U. S. Public Health Service, who emphasized that crystalline silica was the essential causative factor. D. E. Cummings of the Saranac Laboratories described dust measurements, emphasized the importance of routine medical examinations, and stated that demonstrable silicosis generally occurred after more than five years' exposure to concentrations of pure silica in excess of 5,000,000 particles per cubic foot. The third paper, by Gardner, is much the most complete and perhaps the most important of the series. His own work is tersely reviewed, and much interesting and informative data are added on the relation of tuberculous infection to silicosis. The fourth paper, on occupational history, was given by Cummings, who was followed by Henry K. Kessler of Newark, N. J., who discussed clinical aspects and physical examination. This paper provoked an especially interesting discussion on the degree of disability attending silicosis—a vexing subject, on which William S. McCann of Rochester, N. Y., wrote more fully in the last section of the booklet. H. L. Sampson of the Trudeau Sanatorium and H. K. Pancoast of Philadelphia each contributed to the roentgenology of silicosis. Philip Drinker of Harvard described engineering methods of prevention, and A. J. Lanza closed the symposium with an eloquent and timely plea for careful medical control, with the pointed suggestion that executives whose employees risk silicosis would do well to interest themselves in preventive measures and in sensible legislation. Dr. Gardner is to be congratulated on this symposium, and the Employers Mutuals on making the several lectures available in book form. However, the transactions do not measure up to the standards of the work of the several speakers, with the possible exception of Gardner's own contribution. Also, it is hoped that future editions of these symposiums will contain summaries.

Die Mikrogasanalyse und ihre Anwendung. Von Dr. Heinrich Schwarz, Privatdozent an der Universität Wien. Monographien aus dem Gesamtgebiete der Mikrochemie. Paper. Price, 21 marks. Pp. 286, with 52 illustrations. Vienna & Leipzig: Emil Haim & Co., 1935.

The author covers all well known methods of gas analysis in this volume, as well as the purely micro methods of Krogh, and includes a description of the various methods of determining the gas content of fluids. Most emphasis is placed on the manometric methods of Van Slyke and Neill, to which fifty-five pages are devoted. The usefulness of the methods in biologic and physiologic problems is covered. The work includes all necessary tables to aid calculation. The author writes in a style that is easily read or translated. The format of the book is good and the illustrations are adequate.

Doctor Hoon. By Catherine Meadows. Cloth. Price, $2.50. Pp. 313. New York: G. P. Putnam's Sons, 1935.

This is a novel based on the life of the famous Harvey Hawley Crippen. The Crippen case is one of the most important in criminology, deriving its interest from the medical background of the murderer and from the fact that the radio was used in his capture. The novel provides not only an excellent picture of its period but also a fine psychologic study of the murderer and of the events leading up to the crime. The book is written in a calm manner, which adds much to its suspense and therefore to its interest. The sequence of the events leading certainly toward a situation in which murder seems inevitable is established by the author with extraordinary understanding.

Physiopathologie des traversées cellulaires et bactériennes dans l'organisme. Par Noël Fiessinger, professeur de pathologie expérimentale et comparée. Paper. Price, 45 francs. Pp. 370, with 10 illustrations. Paris: Masson & Cie, 1934.

This volume, based on a course of lectures, is devoted to the consideration of a varied group of phenomena involving the passage of substances through cellular membranes (except the absorption of the products of digestion). Among the subjects treated are the metabolism of proteins, carbohydrates and fats, the rôle of the liver, kidneys and endocrine organs in regulating the composition of the blood, and disturbances of the passage of materials resulting in gout, icterus, uremia, anuria, polyuria, edema and other conditions. In addition there are chapters on the passage of dyes, of large particles, of bacteria and their toxins, and of heavy metals (mercury, bismuth, gold). The subjects of immunity, allergy and anaphylaxis are discussed from the point of view of the physiology and pathology of "passage." In most cases the author dwells not only on the experimental aspects of the question but also on the clinical applications. Unfortunately there is no subject index, and although the author index contains an impressive list of more than 600 names, not a single bibliographic reference is given, thus greatly decreasing the value of the volume to the serious student and to the investigator.

Medical Tactics and Logistics. By Colonel Gustavus M. Blech, Medical Reserve Corps, U. S. Army, and Colonel Charles Lynch, Medical Corps, U. S. Army, Retired. Cloth. Price, $4. Pp. 205. Springfield, Ill., & Baltimore: Charles C. Thomas, 1934.

This book is a somewhat natural continuation of the work of the principal author, who several years ago brought out a little book on map reading which still holds its place among military textbooks. Since that time he has published a manual on topography and a number of monographs in military medical journals on the strategic value of the medical service in war. The present book is the formulation of ideas developed in years of service and research in peace and war and must be accepted as authoritative. It lays a scientific foundation for the philosophy of organized military-medical service in war and exemplifies the practical application of this doctrine by a vivid presentation of diverse phases of an imaginary war on American soil. Technical comments aid the student in overcoming difficulties to be anticipated in future military operations of magnitude. A unique and useful feature of the book is a glossary of military terms, which heretofore has been lacking in military textbooks. Four topographic maps accompany the book. The suggestions in the text as to the way of making use of the maps are almost superfluous, as the maps show the various battlefields even chorographically. The book is a valuable contribution to military literature, as is demonstrated by the acceptance of the dedication by the authors to former Surgeon General Ireland and the foreword by Surgeon General Patterson. It is an almost indispensable addition to the medicomilitary library.

Through the Patient's Eyes: Hospitals, Doctors, Nurses. By Sister John Gabriel, R.N., A.B., Hospital Consultant and Educational Director, Sisters of Charity of Providence. Cloth. Price, $1.50. Pp. 264. Philadelphia, London & Montreal: J. B. Lippincott Company, 1935.

The author of this book has had an extensive experience in nursing administration. Her volume, which is planned primarily for nurses, is intended no doubt to improve the hospital morale and to lead nurses into a better appreciation of the patient's point of view. She considers as well the question of what the patient is to be told, the attitude of friends and relatives, and the general subject of service in the hospital.

Introduction to Physiological Chemistry. By Meyer Bodansky, Ph.D., Director of Laboratories, John Sealy Hospital, Galveston. Third edition. Cloth. Price, $4. Pp. 662, with 39 illustrations. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Ltd., 1934.

The general plan of the previous edition has been followed in the rewriting of this book. Much of the material has been extended to include the more recent advances. The confirmation of the isolation of urease, the isolation of trypsin and the study of these isolated enzymes is discussed in the present edition, as is also the importance of secretion of mucus in the reduction of gastric acidity. In the case of the vitamins there is much general knowledge, but in a few instances the author's

ideas of therapeutic value are quite optimistic. The section on hormones has been rewritten to include analysis of crystalline insulin and a discussion of the importance of the adrenal cortical hormone. Approximately a hundred pages has been added to the text. The book is replete with bibliographic references, which enhance its usefulness. The discussion is presented in simple, understandable style. The book is not of a type suitable for clinical teaching but is one that should serve well the needs of the basic science or medical student.

Medicolegal

Pneumoconiosis Attributed to Inhalation of Coke Dust.—Grammer was employed as a still cleaner by the Mid-Continent Petroleum Corporation. The work of a cleaner was to rake down coke, burning or smoldering, in stills that escaped the mechanical rake, and sweep it out. The breaking up of these coke deposits gave off dust and a trace of gases. Grammer worked steadily in that capacity for about ten years, at the expiration of which time he became ill and died. His physician diagnosed his condition as pneumoconiosis. The widow of the workman, as the administratrix of his estate, brought a common law action against the Mid-Continent Petroleum Corporation for the workman's wrongful death, alleging that the corporation failed to provide Grammer with a reasonably safe place in which to work and with reasonably safe appliances with which to work, and that it failed to warn or to instruct him with respect to the dangers incident to the work. The trial court, at the close of the plaintiff's evidence, directed a verdict for the defendant, and the plaintiff appealed to the United States circuit court of appeals, tenth circuit.

Among other reasons for directing a verdict, the trial court was of the opinion that there was no substantial proof that death resulted from the workman's work. The proof was most unsatisfactory, said the circuit court of appeals. Conceding that death resulted from pneumoconiosis, the attending physician's opinion that it resulted from the work was formed, he testified, because he could find no other reason for it. However, said the court, pneumoconiosis concededly results from deposits of foreign material, and Grammer did work in a dust-laden atmosphere. That the physicians who testified never knew of another still worker becoming so affected, and that the medical books contain reference to no other case, merely goes to the weight of the evidence. In the opinion of the appellate court, the evidence was sufficient to justify a submission of the question to the jury. If Grammer died of pneumoconiosis, and if his occupation had anything to do with it, it was because of the dust in which he worked. He knew the dust was present when he took the job and he kept it year after year. He knew it was harmful to the lungs, for he was furnished with a respirator and told to wear it. While assuming the ordinary, known risks attendant on inhaling dust-laden air, he did not assume the risk of any concealed dangers lurking in the dust. The plaintiff contended that the presence of carbon monoxide and hydrogen sulphide in the stills contributed to the pneumoconiosis. Any finding by a jury, said the court, that hydrogen sulphide or carbon monoxide had anything to do with the pneumoconiosis would rest on speculation. There was nothing in the record to warrant a finding that, after the forced ventilation, there remained in the stills a sufficient amount of the gases to do injury. There was, furthermore, no evidence of acute or chronic poisoning of still workers due to either gas.

The petroleum corporation, continued the court, was engaged in the refining of oil, a business attended with some danger as are nearly all constructive undertakings. Its equipment was standard and not defective. It followed the approved practices. It did all that was then known to minimize the risk to its employees. It operated year after year with no occupational disease resulting from the work. It had no reason to suspect any such. Tested by the principles of fault which underlie recovery for injuries at common law, concluded the court, we do not believe that the plaintiff has established her case. The judgment of the trial court was consequently affirmed.—*Grammer v. Mid-Continent Petroleum Corporation, 71 F. (2d) 38.*

Society Proceedings

COMING MEETINGS

American Medical Association, Atlantic City, N. J., June 10-14. Dr. Olin West, 535 North Dearborn Street, Chicago, Secretary.

American Academy of Pediatrics, New York, June 7-8. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.

American Association for the Study and Control of Rheumatic Diseases, Atlantic City, N. J., June 10. Dr. Loring T. Swaim, 372 Marlborough Street, Boston, Secretary.

American Association for Thoracic Surgery, New York, June 3-5. Dr. Duff S. Allen, 3720 Washington Boulevard, St. Louis, Secretary.

American Association of the History of Medicine, Atlantic City, May 6. Dr. Edward J. G. Beardsley, 1919 Spruce Street, Philadelphia, Secretary.

American Association on Mental Deficiency, Chicago, April 25-27. Dr. Groves B. Smith, Beverly Farms, Godfrey, Ill., Secretary.

American Bronchoscopic Society, Toronto, Canada, June 1. Dr. Lyman Richards, 319 Longwood Drive, Boston, Secretary.

American College of Physicians, Philadelphia, April 29-May 3. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.

American Dermatological Association, White Sulphur Springs, W. Va., May 2-4. Dr. William H. Guy, 500 Penn Avenue, Pittsburgh, Secretary.

American Federation of Organizations for the Hard of Hearing, Cincinnati, June 2-6. Miss Betty C. Wright, 1601 35th Street N. W., Washington, D. C., Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 10-11. Dr. Russell S. Boles, 1901 Walnut Street, Philadelphia, Secretary.

American Gynecological Society, Hot Springs, Va., May 27-29. Dr. Otto H. Schwarz, 630 South Kingshighway Boulevard, St. Louis, Secretary.

American Heart Association, Atlantic City, N. J., June 11. Dr. Irl C. Riggin, 50 West 50th Street, New York, Executive Secretary.

American Laryngological Association, Toronto, Canada, May 29-31. Dr. William V. Mullin, 2020 East 93d Street, Cleveland, Secretary.

American Laryngological, Rhinological and Otological Society, Toronto, Canada, June 3-5. Dr. Robert L. Loughran, Sharon, Conn., Secretary.

American Neurological Association, Montreal, Canada, June 3-5. Dr. Henry Alsop Riley, 117 East 72d Street, New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. J. Milton Griscom, 2213 Walnut Street, Philadelphia, Secretary.

American Orthopaedic Association, Philadelphia, June 5-8. Dr. Ralph K. Ghormley, Mayo Clinic, Rochester, Minn., Secretary.

American Otological Society, Toronto, Canada, May 27-29. Dr. Thomas J. Harris, 104 East 40th Street, New York, Secretary.

American Pediatric Society, Cleveland, May 2-4. Dr. Hugh McCulloch, 325 North Euclid Avenue, St. Louis, Secretary.

American Physiotherapy Association, Atlantic City, N. J., June 11-12. Miss Louise Jetter, 17 East Styles Avenue, Collingswood, N. J., Secretary.

American Proctologic Society, Atlantic City, N. J., June 10-11. Dr. Frank G. Runyeon, 1361 Perkiomen Avenue, Reading, Pa., Secretary.

American Psychiatric Association, Washington, D. C., May 13-17. Dr. William C. Sandy, State Education Building, Harrisburg, Pa., Secretary.

American Radium Society, Atlantic City, N. J., June 10-11. Dr. Edward H. Skinner, 1103 Grand Avenue, Kansas City, Mo., Secretary.

American Society for Clinical Investigation, Atlantic City, May 6. Dr. H. L. Blumgart, 330 Brookline Avenue, Boston, Secretary.

American Society of Clinical Pathologists, Atlantic City, N. J., June 7-9. Dr. A. S. Giordano, 531 North Main Street, South Bend, Ind., Secretary.

American Surgical Association, Boston, June 6-8. Dr. Vernon C. David, 59 East Madison Street, Chicago, Secretary.

American Therapeutic Society, Atlantic City, N. J., June 7-8. Dr. Oscar B. Hunter, 1835 Eye Street N. W., Washington, D. C., Secretary.

Arizona State Medical Association, Phoenix, April 25-27. Dr. D. F. Harbridge, 15 East Monroe Street, Phoenix, Secretary.

Association of Clinical Dietitians of the United States and Canada, Atlantic City, N. J., June 10-12. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association for the Study of Allergy, Atlantic City, N. J., June 10-11. Dr. Warren T. Vaughan, 808 Professional Building, Richmond, Va., Secretary.

Association for the Study of Internal Secretions, Atlantic City, N. J., June 10-11. Dr. F. M. Pottenger, 1214 Wilshire Boulevard, Los Angeles, Secretary.

Association of American Physicians, Atlantic City, May 7-8. Dr. James H. Means, Massachusetts General Hospital, Boston, Secretary.

California Medical Association, Yosemite, May 13-16. Dr. F. C. Warnshuis, 450 Sutter Street, San Francisco, Secretary.

Conference of State and Provincial Health Authorities of North America, Atlantic City, N. J., June 15. Dr. A. J. Chesley, State Department of Health, St. Paul, Secretary.

Connecticut State Medical Society, New Haven, May 22-23. Dr. C. W. Comfort Jr., 79 Elm Street, New Haven, Secretary.

District of Columbia, Medical Society of the, Washington, May 1. Dr. C. B. Conklin, 1718 M Street N.W., Washington, Secretary.

Florida Medical Association, Ocala, May 13-15. Dr. Shaler Richardson, 111 West Adams Street, Jacksonville, Secretary.

Georgia, Medical Association of, Atlanta, May 7-10. Dr. Allen H. Bunce, 139 Forrest Avenue N.E., Atlanta, Secretary.

Illinois State Medical Society, Rockford, May 21-23. Dr. Harold M. Camp, Lahl Building, Monmouth, Secretary.

Iowa State Medical Society, Davenport, May 8-10. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.

Kansas Medical Society, Salina, May 8-10. Mr. Clarence Munns, Stormont Building, Topeka, Executive Secretary.

Louisiana State Medical Society, New Orleans, April 29-May 1. Dr. P. T. Talbot, 1430 Tulane Avenue, New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 23-24. Dr. Walter Dent Wise, 1211 Cathedral Street, Baltimore, Secretary.

Massachusetts Medical Society, Boston, June 3-5. Dr. Alexander S. Begg, 8 The Fenway, Boston, Acting Secretary.

Medical Women's National Association, Atlantic City, N. J., June 9-11. Dr. Alice L. Conklin, 55 East Washington Street, Chicago, Secretary.

Mississippi State Medical Association, Biloxi, May 14-16. Dr. T. M. Dye, McWilliams Building, Clarksdale, Secretary.

Missouri State Medical Association, Excelsior Springs, May 6-9. Dr. E. J. Goodwin, 634 North Grand Boulevard, St. Louis, Secretary.
National Association of Private Psychiatric Hospitals, Washington, D. C., June 1. Dr. James M. O'Neill, St. Vincent's Retreat, Harrison, N. Y., Secretary.
Nebraska State Medical Association, Omaha, May 14-16. Dr. R. B. Adams, Center-McKinley Building, Lincoln, Secretary.
New Hampshire Medical Society, Manchester, May 7-8. Dr. Carleton R. Metcalf, 5 South State Street, Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, April 30-May 2. Dr. J. B. Morrison, 66 Milford Avenue, Newark, Secretary.
New York, Medical Society of the State of, Albany, May 13-15. Dr. Daniel S. Dougherty, 2 East 103d Street, New York, Secretary.
North Carolina, Medical Society of the State of, Pinehurst, May 6-8. Dr. L. B. McBrayer, Southern Pines, Secretary.
North Dakota State Medical Association, Minot, May 27-28. Dr. Albert W. Skelsey, 20½ Broadway, Fargo, Secretary.
Oklahoma State Medical Association, Oklahoma City, May 13-15. Dr. L. S. Willour, 203 Ainsworth Building, McAlester, Secretary.
Rhode Island Medical Society, Providence, June 6. Dr. J. W. Leech, 167 Angell Street, Providence, Secretary.
Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., June 10-11. Dr. W. C. Spain, 116 East 53d Street, New York, Secretary.
Society of Surgeons of New Jersey, Atlantic City, May 15. Dr. Walter B. Mount, 21 Plymouth Street, Montclair, Secretary.
South Carolina Medical Association, Florence, April 23-25. Dr. E. A. Hines, Seneca, Secretary.
South Dakota State Medical Association, Pierre, May 13-15. Dr. John F. D. Cook, Langford, Secretary.
Southern California Medical Association, Arrowhead Springs, May 3-4. Dr. Robert W. Langley, 1930 Wilshire Boulevard, Los Angeles, Secretary.
Texas, State Medical Association of, Dallas, May 13-16. Dr. Holman Taylor, 708 Medical Arts Building, Fort Worth, Secretary.
West Virginia State Medical Association, Wheeling, May 6-8. Mr. Joe W. Savage, Public Library Building, Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Archives of Ophthalmology, Chicago

13: 151-320 (Feb.) 1935

*New Theory of Binocular Vision. F. H. Verhoeff, Boston.—p. 151.
Nematode Thelazia Californiensis as Parasite of Eye of Man in California. C. A. Kofoid, Berkeley, Calif., and O. L. Williams, Stockton, Calif.—p. 176.
Relation of Glaucoma to Blood Pressure. P. Weinstein, Budapest, Hungary.—p. 181.
Chemistry of Lens: VI. Lipids. A. C. Krause, Baltimore.—p. 187.
Detachment of Retina: Operative Results in One Hundred and Fifty Cases. J. H. Dunnington and J. P. Macnie, New York.—p. 191.
Neuroretinitis Associated with Symptoms of Ergot Poisoning: Report of Case. D. Kravitz, Brooklyn.—p. 201.
Metastasis in Choroid From Adenocarcinoma of Testicle. I. Goldstein and D. Wexler, New York.—p. 207.
Age as an Important Factor in Amount of Light Needed by Eye. C. E. Ferree, G. Rand and E. F. Lewis, Baltimore.—p. 212.
Cholesterol Content of Cataractous Human Lenses. P. W. Salit and C. S. O'Brien, Iowa City.—p. 227.
Nystagmus in Infants: Report of Case of Monocular Horizontal Type. P. J. Moorad, Canandaigua, N. Y.—p. 238.

Theory of Binocular Vision.—Verhoeff states that corresponding retinal units are represented separately somewhere in the brain but that each of every pair is represented in consciousness by the same single unit. When this conscious unit receives the stimulus from one retinal unit it excludes the stimulus from the corresponding unit. For the process by which, in consciousness, stimuli from one eye are thus substituted for those from the other, the term "replacement" is suggested. The controlling factor in this process is attention. For individual retinal units replacement is always totally complete, but for retinal images it may be complete or incomplete. Replacement cannot reverse the relation of a conscious image to its contiguous background unless this reversed relation already exists between one of the retinal images and its own background. For the seeing of two corresponding images as one, the term "unification" is suggested. True unification is accomplished by the complete or partial replacement in the conscious image of one retinal image by its corresponding image. When the two retinal images are nearly alike the conscious image has a nearly constant value, which is nearly the same as that of each retinal image seen with one eye occluded. When the two retinal images differ in intensity or color, the attention and therefore the replacement may fluctuate (rivalry). So-called fusion of disparate retinal images does not occur but seems to occur when two similar disparate images produce the effect of depth and one of them disappears by replacement. It is suggested that this process be termed "quasi-unification." In the stereoscopic perception of depth, quasi-unification generally occurs, but depth perception is possible when both of any pair of disparate images are visible. Two disparate images, as projected on the horopter, appear about half the distance apart when seen stereoscopically as they do when seen in binocular simultaneous vision. When a disparate image disappears during stereopsis, the position of its fellow remains unchanged. Binocular luster is produced when, as the result of replacement, there is represented in a conscious area a mosaic consisting of units or minute areas of high intensity interspersed with areas of low intensity. It differs essentially from monocular luster only in the fact that it is inconstant. Since in stereoscopic vision one of each pair of disparate images can be and generally is invisible, since crossed images cannot be consciously distinguished from uncrossed disparate images and since binocular fixation can occur when one of the images fixed is invisible, it is evident that the process on which stereoscopic perception of depth depends cannot be recognized consciously. Since there is good reason to believe that corresponding retinal images are represented separately in the occipital lobes, it seems possible that the sensory nervous mechanism for stereoscopic perception of depth is situated chiefly in this region.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

16: 65-128 (Feb.) 1935

Practical and Experimental Uses of Fluorescence in Medicine. C. J. Sutro and M. S. Burman, New York.—p. 71.
Anterior Poliomyelitis and Its After-Care. L. W. Hubbard, Warm Springs, Ga.—p. 76.
Moot Aspects of Short and Ultrashort Wave Therapy. C. K. Gale, New York.—p. 80.
*Ultraviolet Therapy of Gonococcic Cervicitis: Preliminary Report. M. Abramson, Minneapolis.—p. 84.
Results of Short Wave and Ultrashort Wave Therapy (Radiothermy). D. H. Kling, Los Angeles.—p. 88.
The Flasher Sinusoidal Machine. J. Weiss, Brooklyn.—p. 95.
Zinc Ionization in Intumescent Rhinitis. M. L. Harris, Brooklyn.—p. 97.
Zinc Ionization in Otolaryngology. C. B. Sputh, Indianapolis.—p. 98.
Chronic Otorrhea, with Especial Reference to Zinc Ionization and Ultraviolet. G. P. Morison, Martinsburg, W. Va.—p. 101.

Ultraviolet Therapy of Gonococcic Cervicitis.—Abramson treated fifty cases of gonococcic cervicitis with ultraviolet rays. The patients showed a profuse purulent cervical discharge with marked erosion and eversion of the lips of the cervix. In most cases an associated urethritis was present, and three presented a bilateral bartholinitis. The vagina and cervical canal were swabbed clean with cotton. A cotton applicator was placed in powdered Carica papaya and then carried to the cervical canal. Within twenty to forty seconds the mucus had been entirely digested and liquefied and the cervical canal was clean and could be treated properly. Following this cleansing the cervical canal and any erosions were painted with 10 per cent silver nitrate. The orificial applicator was then inserted into the canal to the internal os and treatment given. All cases were started with a minute and a half exposure. The length of time of the exposures was rapidly increased to ten minutes. An exposure of three minutes was just as effective clinically as the longer treatments; therefore treatments of a maximum of only three minutes were given. With few exceptions, after four or five treatments the cervical smears became negative with no subsequent positive smears. The amount and character of the discharge rapidly changed from the profuse purulent type to normal. On returning for a checkup preliminary to discharge, all cases showed a normal cervical secretion, at least three negative smears and no clinically suggestive signs. The effect of the ultraviolet irradiation was not as rapid in curing a marked and extensive erosion of the cervix as in stopping the discharge. Cases of erosion not healing after several ultraviolet treatments were treated by the Kimble-Jaros and Cherry technics of cervical coagulation. In

every case treated the end result was healing of the lesion. Patients were treated twice weekly and the average number of treatments given was twenty. There were no ill effects from the treatment, although two of the cases showed a small amount of bleeding after each removal of the applicator. Four patients also complained of uterine cramps at various times during the treatment but these were not constant and did not affect the results. In comparing seventy patients who had been on the usual routine treatment it was found that the average case was treated twice weekly and that the average length of treatment was eighteen months.

Archives of Surgery, Chicago

30: 179-370 (Feb.) 1935

Etiology and Treatment of Clavicot: Report of Results in One Hundred and Two Feet Treated by Anterior Tarsal Resection. J. T. Saunders, New York.—p. 179.

*Massive Intravenous Injections: Experimental Study. H. J. Warthen, Richmond, Va.—p. 199.

*Primary Isolated Lymphogranulomatosis of the Stomach: Report of Case. H. N. Comando, Newark, N. J.—p. 236.

Congenital Abscess of Penis. R. B. Drury and H. H. Schwarzell, Columbus, Ohio.—p. 236.

Effects of Local Immunization on Development of Experimental Abscesses of Lung. W. M. Tuttle, St. Louis, and F. R. Cannon, Chicago.—p. 243.

*Epithelioma Following Avulsion of Scalp: Report of Case. E. L. Burns, St. Louis.—p. 266.

Gastric Secretion: VI. Action of Pilocarpine on Secretions of Transplanted Gastric Pouch Without Auerbach's Plexus. E. Klein, New York.—p. 277.

Treatment of Fractures of Vertebral Bodies Uncomplicated by Lesions of Cord. W. A. Rogers, Boston.—p. 294.

The Schilling Hemogram in Appendicitis. H. A. Carlson and Lucretia Wilder, Minneapolis.—p. 325.

Relation of Arteries to Roots of Nerves in Posterior Cranial Fossa in Man. J. C. Watt and A. N. McKillop, Toronto.—p. 334.

Acute Appendicitis in Children. C. S. Stone Jr., Santa Barbara, Calif. —p. 346.

Therapeutic Use of Concentrated Streptococcus Serum of New York State Department of Health in Infected Wounds. Adele E. Shepler, Martha Jane Spence and W. J. MacNeal, New York.—p. 357.

Massive Intravenous Injections.—Warthen states that large amounts of the usual solutions used for infusions may be injected intravenously into dogs without causing death or evidence of cardiac embarrassment. Injections of excessive amounts of fluid result in cerebral or pulmonary edema. The most favorable changes in the blood chemistry occur with infusions of isotonic solutions of dextrose and sodium chloride. A 5 per cent solution of dextrose causes slightly more desirable changes than does a 0.7 per cent solution of sodium chloride. Injections of hypertonic solutions of dextrose and sodium chloride cause distinctly unfavorable changes in the blood chemistry. The blood sugar value increases following infusions of 0.7 per cent sodium chloride solution and decreases following infusions of hypertonic sodium chloride solution. Large infusions of dextrose and of sodium chloride solutions cause little if any change in the fragility of the red blood cells. There is a marked acceleration of the pulse rate during intravenous infusions. The injection of fluids intravenously results in an initial rise in the arterial blood pressure. This is followed by a secondary fall to, or slightly below, the preinjection level during infusions of isotonic solutions. This secondary fall is diminished or absent during infusions of hypertonic solutions. There is a marked increase in the venous pressure during large intravenous infusions. Diuresis is most marked following infusions of 5 per cent dextrose solution. Edema of the subcutaneous tissues does not occur following the rapid injection of large amounts of fluid intravenously. Edema of the wall of the stomach and of the intestine associated with fluid in the gastro-intestinal tract and in the peritoneal cavity does occur following large intravenous infusions. The intravenous injection of 10 per cent dextrose solution results in frequent fatalities in dogs.

Primary Isolated Lymphogranulomatosis of Stomach.—Comando points out that Hodgkin's disease may originate in the lymphoid tissue of the gastro-intestinal tract and remain as a localized tumor for some time. The diagnosis usually made is that of carcinoma. Before the days when gastric resection was the operation of choice for gastric tumors and for infiltrating gastric ulcers, virtually no cases similar to the one the author describes were reported in the literature. This type of gastric lesion is a distinct clinical entity, and the favorable results that have followed operative treatment in several cases more than justify the radical operation. The pathologic changes noted in his case were those of an infiltration of the distal portion of the pars media and the proximal part of the pyloric portion of the stomach. A Wassermann test was advised in order to rule out syphilis before an interpretation of the condition as a malignant process was accepted. An increased density was noted in the region of the liver. A small deposit was noted in the lower lobe of the left lung. The patient left the operating room in good condition and made an uneventful recovery. In two months he had gained 25 pounds (11.3 Kg.), had returned to his usual occupation and was able to eat all kinds of food. A careful follow up has shown no evidence of any recurrence and the patient continues to feel well.

Epithelioma Following Avulsion of Scalp.—Burns describes the late onset of fatal complications and their character following avulsion of the scalp. The sequence of events was (1) spontaneous epithelization over a period of sixteen years, (2) subsequent ulceration and infection of a portion of the healed area during pregnancy, (3) development of osteomyelitis of the skull, which later necessitated removal of the top of the calvarium, (4) failure in attempts at plastic repair, and (5) death with symptoms of meningitis twenty-one years after the accident. At the time of necropsy, direct growth of tumor cells across the meninges and through the brain substance was established. From the histologic study it seems probable that these cells preceded and marked the path of infection which developed later. The external irritating agencies played the most important part in producing a malignant tumor.

Arkansas Medical Society Journal, Fort Smith

31: 143-166 (Feb.) 1935

Colon Dysfunction. H. G. Rodney, Memphis, Tenn.—p. 143.

Chiasmal Syndrome: Report of Cases. A. H. Mann, Texarkana.—p. 149.

Canadian Public Health Journal, Toronto

26: 1-52 (Jan.) 1935

Contact with Infection in Tuberculosis: Its Rôle in Disease Production and Protection. S. L. Cummins, Cardiff, Wales.—p. 1.

Development of Public Health in Prince Edward Island. B. C. Keeping, Charlottetown, Prince Edward Island.—p. 9.

Housing in Montreal. A. Cousineau, Montreal.—p. 15.

Public Health Aspects of Wading Pools for Children. W. J. McCormick, Toronto.—p. 26.

Government Control of Veterinary Biologic Products. G. Hilton, Ottawa, Ont.—p. 33.

Journal of Urology, Baltimore

33: 83-300 (Feb.) 1935

Dynamic Hydronephrosis and Sympathectomy of Ureter. L. Caporale, Turin, Italy.—p. 83.

Surgical Treatment of Hydronephrosis. J. C. Kimbrough, Washington, D. C.—p. 97.

*Complete Nephro-Ureterectomy: New Method Employing Principle of Electrocoagulation to Intramural Portion of Ureter. J. A. C. Colston, Baltimore.—p. 110.

Papillary Carcinoma and Hypernephroma Occurring in the Same Kidney: Report of Case. J. F. Balch, Indianapolis.—p. 138.

Nephrectomy Versus Autonephrectomy in Renal Tuberculosis. T. E. Gibson, San Francisco.—p. 145.

Extension Operation for Tuberculosis of Epididymis. A. B. Cecil, Los Angeles.—p. 160.

*Further Studies of Methylene Blue in Treatment of Urinary Tuberculosis with Presentation of Purified Drug. B. E. Greenberg, M. L. Brahey, T. L. Davis and Catherine Armstrong, Boston.—p. 168.

Diversion of Urinary Stream. G. G. Smith, Boston.—p. 179.

Automatic Intermittent Bladder Irrigation Apparatus. J. R. Perdue, Durham, N. C.—p. 198.

Complete Nephro-Ureterectomy.—Colston outlines a simplified technic by which complete nephro-ureterectomy can be accomplished, avoiding the technical difficulties and postoperative complications that may occur when a cuff of mucous membrane about the ureteral orifice is excised. The operation is indicated in the treatment of primary tumors of the ureter and papillary tumors of the pelvis of the kidney. In many cases of renal tuberculosis, in addition to nephrectomy, there is also a definite indication for ureterectomy. The extent of the tuberculous process in the ureter can best be determined by a study of the ureterogram. Alternate areas of constriction and dila-

tation with a "moth eaten" appearance of the edges of the pyelographic medium in the ureter provide sufficient evidence to diagnose an extensive ulcerative tuberculous ureteritis. In such cases, excision of the ureter is definitely indicated. The operation of nephro-ureterectomy or ureteronephrectomy entails little more shock to the patient than a simple nephrectomy. Three cases presenting different pathologic conditions are reported. Previous to the operation the bladder is distended with sterile water. The anesthesia may be chosen according to the surgeon's preference. The usual incision is made, commencing in the costal angle and extending down below the twelfth rib for a variable distance, depending on the necessity of the case. The muscles are divided, the deep fascia is opened and divided up to and including the costovertebral ligament, the kidney is separated from adhesions and the pelvis and ureter are dissected free, the separation of the latter structure being carried down to the brim of the bony pelvis. The vascular pedicle is isolated and controlled with three clamps, the kidney is excised and the vascular stumps are tied twice with chromic catgut. The kidney is replaced in the wound, which is packed with gauze. The patient is then turned to a prone position, with the head somewhat depressed and tilted on the table away from the side of operation. An incision is made parallel with Poupart's ligament, the muscles are divided in the line of their fibers, the peritoneum is pushed toward the midline and the ureter is picked up and separated from the retroperitoneal structures. The ureter is completely separated from all structures down to its entry in the bladder. It is clamped twice just above the bladder and divided with the electric cautery. The exposed ureteral mucosa of each stump is thoroughly and completely destroyed by the electrocautery, the proximal stump is tied with catgut and the clamp is removed. The distal stump of the ureter is grasped by its wall on each side, the clamps being placed in such a manner as not to occlude the lumen. The occluding clamp is removed. A coagulating electrode with a bulbous end of about 10 F. is introduced into the ureteral lumen and passed slowly back and forth through the lumen, with an appropriate current strength until the entire mucosa of the ureter has been destroyed. The distal stump is ligated and the wound is closed in layers with tube drainage. The patient is replaced in the nephrectomy position, and by gentle traction and blunt dissection the ligated proximal stump is drawn up and the kidney and ureter are removed intact. The nephrectomy incision is closed in layers with drainage.

Methylene Blue in Treatment of Urinary Tuberculosis.—The studies of Greenberg and his associates indicate that the impurities in methylene blue are responsible for the untoward symptoms produced when the drug is used in urinary tuberculosis, thus demonstrating that the blue dye is present as in the spontaneously colored kidneys, but in the nonblue form, and that the production of a pure drug is essential. Through the work of Armstrong the authors are now provided with an almost perfectly pure product. They have used this in four cases. It has produced no irritating symptoms and the cases show improvement as in the cases which benefited by the commercial product when tolerated. Whatever benefit results from the use of methylene blue should be ascribed to the dye and not to its impurities. A method has been devised for the preparation of pure methylene blue.

Laryngoscope, St. Louis

48:81-162 (Feb.) 1938

Window Operation for Hemotomas Aorta and Perichondritis with Effusion. R. C. Howard, New York.—p. 81.
Ozenyosis in Hawaii. C. W. Trusdell, Honolulu, T. H.—p. 106.
*Hydrostatic Ionization of Nose. C. E. Gale, New York.—p. 110.
Chronic Sinusitis in Children: Diagnosis and Treatment: Case Reports. W. Spielberg, New York.—p. 114.
Edema of Brain Due to Acute Maxillary Sinusitis. H. Dinsmore, Philadelphia.—p. 120.
Intestinal Bacterial Flora in Chronic Sinus Disease. S. N. Parkinson, Oakland, Calif.—p. 140.
Some Clinical Observations on Influence of Certain Hypotensive Agents in Cigarets. F. B. Flint, New York.—p. 149.

Hydrostatic Ionization of Nose.—Gale uses the following technic: The patient is seated with the head slightly inclined forward. The nasal tip of a glass tube about 7½ inches long with a sealed-in electrode at the base of the tube is inserted into one nostril, sufficiently snug to prevent leakage. The positive pole of the galvanic apparatus is connected with the sealed-in electrode, while the patient holds in one hand a moistened pad connected with the negative electrode. The top of the tube is funnel shaped and through it the ionizing solution (1 per cent zinc sulphate) is slowly poured. Since the top of the glass tube is above the level of the nose, the solution in the nose will rise to the same level it occupies in the tube. In this way the entire nasal cavity will be flooded. As the fluid touches the nasopharynx, the soft palate is automatically raised and the solution begins to escape from the opposite nostril. At this point the patient occludes the opposite nostril, and the entire nose is filled with ionizing solution and ionization is already taking place, as electrical contact has been made. The patient holds the mouth open and breathes deeply. There will be some slight escape of solution from the throat, which is readily made up by pouring more solution into the funnel to keep it at the proper level. The duration of treatment is from ten to twenty minutes, and from 6 to 10 milliamperes of current is used. The author's results obtained in allergic conditions of the nose and chronic catarrhs have been good.

Michigan State M. Society Journal, Grand Rapids

34:59-136 (Feb.) 1935

Appraisal of Methods of Treating Pneumonia. C. C. Sturgis, Ann Arbor.—p. 59.
Treatment of Facial Wounds Due to Motor Accidents. C. L. Straith, Detroit.—p. 64.
Biologic Unity of Hypertensive Arterial Disease. E. J. Stieglitz, Chicago.—p. 70.
Suggestion for Classification of Certain Allergic Dermatoses. M. B. Salzberger, New York.—p. 78.
Extraperitoneal Ovarian Cyst: Report of Case. W. L. Hackett and M. M. Silverman, Detroit.—p. 84.
Gridiron Incision in Appendicitis. C. R. Davis, Detroit.—p. 85.
Welfare Medical Service in Oakland County. R. G. Tuck, Pontiac.—p. 89.
Idiopathic Magnesium Occurring in Woman Forty-Five Years of Age. E. J. Bennell, Traverse City.—p. 92.
As Seen Abroad. J. Powers, Saginaw.—p. 93.

Missouri State Medical Assn. Journal, St. Louis

32:37-80 (Feb.) 1935

*Experimental Production of Fat (Pancreatic) Necrosis. M. P. Neal and H. M. Ellis, Columbia.—p. 37.
Influence of Preventorium Treatment on Prognosis of Tuberculosis. A. C. Hamlin and C. W. Elders, St. Louis.—p. 41.
Accidents. A. S. Welch, Kansas City.—p. 45.
Carcinoma of Cervix: Results of Treatment in One Hundred and Thirty-Six Cases. E. S. Auer, St. Louis.—p. 47.
Pregnancy Test as Guide in Management of Ectopic Pregnancy. M. A. Bubbis, St. Louis.—p. 50.
The Neurotic: Challenge. G. W. Robinson Jr., Kansas City.—p. 53.
High Blood Pressure as Symptom and When It May Be Called Malignant. E. Schlafer, St. Louis.—p. 56.

Experimental Production of Fat Necrosis.—Neal and Ellis produced experimental fat necrosis by the injection of commercial pancreatin, pancreatic secretions from dogs, and purified and concentrated lipase fractions derived from animal and vegetable sources. The various lipase fractions possessed physical and chemical properties characteristic of enzymes in that they were not thermostable, they were inactivated by ethyl alcohol in strengths above 50 per cent, strong acids and strong alkalis, and they decomposed ethyl butyrate. The highly purified fractions were colloidal in character and were globulin-like. The lipase containing fractions showed no species specificity for animals in their ability to produce fat necrosis, as evidenced by the fact that the lesion has been experimentally produced in vertebrates (fish, turtles, birds and mammals) in which the body temperatures ranged from 18 to 43 C. (64.4 to 109.4 F.). Clinical fat necrosis goes through a normal process of repair and is not a fatal lesion, but the condition that precedes it and is responsible for it is often fatal. The presence of fat necrosis in the intra-abdominal fat or in wounds of the abdominal wall indicates a damage either to the pancreas or to a pancreatic duct. The fat necrosis then is a secondary and not a primary lesion. In experimental animals, all stages of the lesion up to complete repair have been found. In the human subject at necropsy or in cases in which a second surgical procedure is necessary within the abdominal cavity after fat necrosis had been observed at a previous operation,

one may find repair even to a complete disappearance of such previous areas. In the experimental work the authors used every reasonable animal and chemical control to prove that they were dealing with a purified lipase fraction and that the various extractives employed were not capable in themselves of producing these changes. Injections of the extractives of Jo values even beyond the ranges employed have failed to produce the condition. Histologic examinations of all material were done, irrespective of the gross observations, as a means of eliminating false interpretations, such as postmortem changes, and to prove that pancreatic lesions were not responsible for the changes.

New York State Journal of Medicine, New York

32:101-144 (Feb. 1) 1932

Vanishing Bronchoscopy of Cardinal Origin. J. H. Globus, New York.—p. 101.

The Common Cold. H. S. Diehl, Minneapolis.—p. 105.

Surgery of Suppurative Cervical Adenitis from Infectious Disease. M. S. Bodkin and L. H. Schwartz, Mount Vernon.—p. 117.

Use of Cecal Drainage in Ruptured Appendicitis. G. H. Downes and E. W. Hanlon Jr., Philadelphia.—p. 119.

Classification of Mental Disorders. E. D. Bond, Willard.—p. 121.

32:147-192 (Feb. 15) 1932

Action of Autonomic Nervous System as Explanation for Therapeutic Value of Carbonic Acid Baths in Degenerative Cardiac Disease. A. Lambert, New York.—p. 147.

Treatment of Diabetic Coma. H. O. Mosenthal, New York.—p. 157.

Diabetic Diathesis in Surgical Cases. A. H. Terry, New York.—p. 159.

Gastrojejunal or Marginal Ulcer. D. F. Weinbren, New York.—p. 161.

Advanced Cardiac Insufficiency: Results of Intensive Ambulatory Treatment with Digitalis Measures. M. Friedenwald, New York.—p. 165.

Phases of Otolaryngology of Interest to the General Practitioner. M. F. Jones, New York.—p. 169.

Westchester County Child Health Examination Program. F. Hall, New Rochelle.—p. 172.

Pennsylvania Medical Journal, Harrisburg

35:289-336 (Feb.) 1932

Surgical Treatment of Chronic Heart Disease by Complete Removal of Normal Thyroid. H. L. Stewart, Boston.—p. 289.

Endocrinology: Present Day Summary. E. Dickson, Harrisburg.—p. 313.

Raising Rate and Premise of Medicine. G. M. Coates, Philadelphia.—p. 320.

Blood Transfusion: Clinical Application. A. P. Forker, Philadelphia.—p. 324.

*Treatment of Prenatal Syphilis with Acetarsone (Stovarsol): Preliminary Report of Results in Seventy-Three Cases. D. M. Pillsbury and H. E. Perkins, Philadelphia.—p. 327.

Report of Three Years' Clinical Study of Scarlet Fever Immunization. Emily P. Dunn, Philadelphia.—p. 331.

Treatment of Prenatal Syphilis with Acetarsone.—Pillsbury and Perkins used acetarsone in the treatment of seventy-three cases of prenatal syphilis, no other form of antisyphilotherapy being given in forty-four. Treatment in a considerable proportion of these cases is not yet completed. The clinical response seems excellent and the initial influence of the drug on the serologic condition of the incompletely treated patients is regarded as satisfactory. Acetarsone has a definite tendency to produce reactions of varied types, some of which may be serious. The advantage of early diagnosis is apparent in the better serologic response in patients less than 1 year of age. Testing of the urine for arsenic may or may not prove a feasible method of control in patients in whom it is suspected that the administration of treatment is being neglected. Acetarsone therapy demands the closest type of observation and control. The following precautions and methods are essential: (1) complete preliminary examination of the patient, including urinalysis, (2) an extremely cautious and reduced dosage level in infants, in patients with the slightest urinary abnormalities and in those who have had previous reactions to the drug, (3) weekly observation and urinalysis, and (4) permanent cessation of acetarsone therapy with the occurrence of any severe reaction. The method deserves continued clinical trial and cannot be regarded as completely evaluated, as (1) adequate information of final results on the basis of five or ten year follow ups is not available, (2) the necessary dosage level is still a subject of considerable dispute, (3) the advisability or necessity of combining it with some type of heavy metal therapy has not been determined, and (4) the drug has a definite tendency to produce reactions, the variety of which is apparently increasing.

Philippine Islands Med. Association Journal, Manila

12:1-50 (Jan.) 1932

Remarks on Recent Trends in Medical Education. A. Cowie, Manila.—p. 1.

Food Poisoning Outbreak in the Philippines. E. Hernando and J. V. Pamintuan, Manila.—p. 16.

Report on Case of Cancer of Sigmoid with Resection of Rectum and Sigmoid. J. Edquen, Manila.—p. 26.

Lobar Pneumonia in Children Under Three Years Old. J. Albert and M. Abad, Manila.—p. 29.

Public Health Reports, Washington, D. C.

Vol. 47: 163-202 (Feb. 5) 1932

Endemic Histolysis in Weddings from Hands and Finger Nails of Infected Persons. Bertha Hughes Spence, J. W. Foster and H. C. Glover.—p. 163.

Comparative Study of Streptococcic Immunity Produced in Rabbits by Host Killed Cultures, by Active Streptococcus and by Immunized Streptococcus. Allen C. Rose.—p. 168.

Principles of Sanitation and Hygiene for Correctional Institutions. H. R. King.—p. 181.

Vol. 47: 203-236 (Feb. 12) 1932

Medical Record in Cuzco. H. T. Hunt.—p. 203.

Family Survey as Method of Studying Rural Health Problems: Broomfield-Greenville Health Administration Studies Number Three. E. H. Pennell.—p. 210.

Science, New York

Vol. 75: 163-210 (Feb. 12) 1932

Rôle of Carbonates Compounds in Transport of Carbon Dioxide by Blood. W. C. Stadie, Philadelphia.—p. 207.

Refractometers to Overlook Stimulation in Human Monkey. R. K. Meyer and E. L. Gaston, Kalamazoo, Mich.—p. 208.

*Control of Bronchial Asthma. H. F. Swinburgh and S. M. Alter, Los Angeles.—p. 210.

Control of Bronchial Asthma.—Swinburgh and Alter prevented the attacks of paroxysmal dyspnea in fifty cases of bronchial asthma by a regimen based on elimination, by postural drainage, of the accompanying bronchial and pulmonary exudate. The first therapeutic step in reduction of the viscidity of the bronchial and pulmonary exudate in order to facilitate its evacuation. Then the patient is instructed to kneel on a chair or stool and place both hands on the floor. The more nearly the thorax approximates an inverted vertical position, the more nearly ideal are the results. While in this position the patient coughs as nearly continuously as possible and postural drainage of the exudate is then accomplished through the combined agencies of the inverse squeeze, ciliary drainage and the bechic blast. The exudate is then expectorated. The inverted position is maintained for a minimum of three minutes, regardless of productivity. This procedure is carried out at least twice daily, preferably on arising and retiring. Coughing during the interval between drainage procedures is the signal that insufficient evacuation of the bronchial passages has been accomplished. Although it is possible by the foregoing procedure to prevent asthmatic attacks when active infections feel are present, total and permanent quiescence of the bronchial and peribronchial inflammation will occur only after ablation of these foci. Some of the authors' patients have been asymptomatic for four years without treatment. Their series consists of a group of severe and recalcitrant cases between the ages of 6 and 75 years. Strict adherence to the regimen has not yet failed to keep the patients free from asthmatic attacks.

South Carolina Medical Assn. Journal, Greenville

31:1-42 (Feb.) 1932

Diagnostic Significance of Visual Fields. D. St. P. Ashill, Columbia.—p. 23.

Present Status of the Radiologist in Treatment of Breast Cancer. J. P. Bonner, Winston-Salem, N. C.—p. 30.

The Use of Some Common Drugs in Urology. J. E. Burke, Columbia.—p. 34.

Southwestern Medicine, Phoenix, Ariz.

16:51-64 (Feb.) 1932

Surgical Mortality of the Southwest. D. M. Davis, Phoenix, Ariz.—p. 55.

Medical Examiner. H. E. Bishop, Albuquerque, N. M.—p. 58.

Treatment of Pneumonia. P. S. Kelly, Chicago.—p. 59.

Review of Two Hundred and Sixty-Eight Appendicectomies. S. H. Morrison, El Paso, Texas.—p. 62.

Laboratory Report on Three Cases of Undulant Fever in New Mexico. Myrtle Greenfield and Thelma McCaslin, Albuquerque, N. M.—p. 63.

Surgery, Gynecology and Obstetrics, Chicago

60: 257-434 (Feb. 15) 1935

Principles of Gastric Surgery. D. C. Balfour, Rochester, Minn.—p. 257.
Infection in Clean Operative Wounds: Nine Year Study. F. L. Meleney, New York.—p. 264.
Infections of Lip and Face. F. A. Coller and L. Yglesias, Ann Arbor, Mich.—p. 277.
Experiences with Tubed Pedicle Flaps. H. Gillies, London, England.—p. 291.
*Pilonidonic Ulceration: Its Recognition and Treatment. E. Holman, San Francisco.—p. 304.
Some Remarks on Chest Cell Tumor of Bone. H. Platt, Manchester, England.—p. 316.
Endocrine Mechanisms in Certain Functional Gynecologic Disorders. E. Novak, Baltimore.—p. 330.
The Unreduced Fracture. E. Speed, Chicago.—p. 341.
Swelling, with Especial Reference to Surgical Possibilities. B. Solomons, Dublin, Ireland.—p. 352.
Hydrocephalus and Spina Bifida. W. Penfield, Montreal.—p. 362.
Diagnosis and Treatment of Hemorrhoids and Fissure-in-Ano. L. Abell, Louisville, Ky.—p. 376.
*Repair of Defects Resulting from Full Thickness Loss of Skin from Burns. J. B. Brown and V. P. Blair, St. Louis.—p. 379.
Living Grafts of Thyroid and Parathyroid Glands. R. B. Raney, J. C. Outhouse and G. G. Gay, Baltimore.—p. 390.
Statistical Study of Diseases of Esophagus. A. S. Macmillan, Boston.—p. 394.
*The Esophagus. H. P. Mosher, Boston.—p. 403.
Esophageal Surgery. E. D. Churchill, Boston.—p. 417.

Pilonidonic Ulceration.—Holman presents four cases exhibiting the characteristic features of progressive and relentless bacterial ulceration of the skin and subcutaneous tissues. The inference is that some intestinal organism or organisms are in some way responsible for these infections. In the four cases reported, one followed an appendectomy, two followed the draining of axillary abscesses secondary to lesions of the hand—one incurred while handling animal fertilizer, the other while grating carrots—and the fourth occurred in a plumber whose clothes were habitually soiled by sewage. In three cases two organisms were invariably found; the streptococcus recovered was hemolytic and aerobic. The author's animal experiments with attempts to reproduce the lesion by inoculation of two organisms singly and in combination corroborate Meleney's observation that two organisms together produce more pronounced lesions than single organisms, but in no instance was he or Meleney able to reproduce the progressive lesion seen in the human cases. In studying the factor of individual resistance a basal metabolic rate of minus 23 and minus 25 per cent was observed in the fourth case. The third patient, when on the road to recovery, showed a normal metabolic rate of plus 7 per cent. In treating such infections, every effort should be made to increase the resistance of the host to infection. This may be accomplished by transfusions, sun baths and a high vitamin diet, augmented by cod liver oil and vitamin B. The uses of Prudentin and Scelig suggested promptly and decisively to blood transfusion from immunized donors. Lastly, the resistance of the host to the infecting organisms was affected in the axillary abscesses by the injection of reagents. In adopting reagent therapy adequate medication, such as morphine, pantopon or sodium amytal, should be employed every two hours to control pain, and the reagents must be used in sufficient number so that every part of the wound is being attacked simultaneously. The cause of the débridement lies in carrying the incision through obviously healthy skin and subcutaneous tissue, and abolishing all pockets in which pus may accumulate and stagnate. All overhanging tissue must be removed. On the first admission of the second patient, in the presence of an advanced infection, the white cells numbered 15,500: polymorphonuclears 62 per cent, banded 07 per cent and segmented 38 per cent. Eleven days later, four days after an extensive débridement, the white cells numbered 12,600: polymorphonuclears 82 per cent, banded 70 per cent, segmented 12 per cent. Thirteen days later, when the suppuration was under better control, the white cells numbered 9,100: polymorphonuclears 64 per cent, banded 17 per cent, segmented 46 per cent. The author states that it seems unlikely, from the fatal outcome in this case, that the deep seated axillary abscesses in the first and third cases could have been successfully treated without recourse to reagent therapy. Complete cautery débridement and the abolition of all pockets was obviously impossible. Only reagents could cope with the dirty edematous granulation tissue, containing numerous organisms, which extended in such instances to the very apex of the axilla. One unexpected advantage resulting from the maggot therapy was the healing that occurred in both axillary abscesses without permanent cicatricial contractures. Full range of motion is now present in both cases. In treating axillary abscesses it is important to support the arm in the abducted position by means of the Balkan frame.

Repair of Defects Resulting from Full Thickness Loss of Skin from Burns.—Brown and Blair outline the essential points of care that have usually proved of benefit for patients in whom a large area of the full thickness of the skin has been destroyed by a burn. 1. The patient should be kept free from pain and from objectionable restraints; sedatives should be used carefully, and interest in the surroundings should be developed. Nutrition must be kept up and transfusions may be required frequently. 2. The local care of the open wounds has for its object the cleaning up of the areas. Surgical drainage is best accomplished by the use of sodium chloride dressings or by the continual sodium chloride bath for from one to three hours a day followed by dry heat or further wet dressings. Many antiseptics (common and proprietary) and gentian violet have been used, but at present the authors rely on surgical solution of chlorinated soda if anything other than sodium chloride is necessary. 3. If large areas are to be covered, it is necessary to develop a method of obtaining free skin grafts of suitable thickness in large amounts, cutting them rapidly and securing prompt healing of the area from which the grafts are taken. The graft (thick split) that they have found most applicable over open wounds is one that includes from one half to three fourths of the thickness of the skin. 4. The care of the grafted area requires a simplified method of applying a pressure dressing and of keeping it moist if necessary; i. e., when there is reason to fear a degree of infection that might damage the graft, a wet sodium chloride dressing with irrigation tubes incorporated in it is put on and pressure is obtained over the area with sea sponges bound on firmly with heavy gauze rolls. The dressings are kept constantly moist for four days, at which time the first dressing is changed. If the area is quite free from contamination, a sponge pressure dressing is applied with a few layers of grease gauze over the graft. 5. In the repair of late burn contractures, free skin grafts can be used extensively and give permanent bearing surfaces in many instances. They often may be substituted for a tedious, laborious use of pedicle flaps that require multiple operations. If there are sinuses extending down into scar folds that harbor organisms detrimental to the chance of a skin graft taking, a preliminary opening is done and sometimes a large open wound is produced. In the grafting of all contaminated open wounds, the thick split graft is used rather than a full thickness graft because of the greater assurance of its taking in such a field. If the late contracture is healed so that a clean operation can be done, the use of a full thickness graft can be undertaken much more safely; but even here the split graft can be used satisfactorily and may even be required if the area to be grafted is so large that the necessary amount of full-thickness skin cannot be sacrificed. 6. Burns of the hands deserve special attention in order to prevent deep infection, which rapidly fixes the tendons and joints and produces deformities that may never be overcome. For deep burns, the first treatment should be active surgical drainage; active movement should be encouraged, the fingers should be dressed apart, and the whole hand should be kept in a position of function. The average burn should be ready for grafting in three weeks, if tendons have not been exposed. 7. The rehabilitation of the patient's activities should be started early, if possible even before surgical restoration is started. In all the working contacts with patients, a firmness of purpose should be maintained that will tend to keep the patient's morale on the highest possible level.

The Esophagus.—In addition to pointing out that fibrosis of the esophagus, especially of the terminal portion, is the result of infection from contiguous organs, Mosher shows that fibrosis of isolated areas is fairly common, especially in such chronic infections as arteriosclerosis. In infections of the blood stream, the esophagus is often involved to the extent of ulceration. In acute infections (pneumonia) the esophagus may be infected. Chronic infection, as shown by an infiltration of

lymphocytes under the epithelium and in the glands and about the gland ducts, is also common. Dilatation of the subepithelial blood vessels is an almost invariable occurrence in diseases, such as cirrhosis of the liver, which impede the venous circulation. Cirrhosis of the liver and infection of the gallbladder are among the chief causes of infection of the esophagus. As necropsy specimens of these conditions accumulate, this fact is becoming more and more evident. Hemorrhage into the muscular layers extensive enough to disrupt them may occur when there is back pressure on the esophageal vessels. The glands of the esophagus are especially liable to infection and are probably the chief route by which the esophagus is infected from within. One form of solitary follicle is simply a collection of lymphocytes following a gland duct to the surface. The esophagus can be infected from within and from without and is often infected in both acute and chronic disease. In the esophagus, fibrosis follows infection, as it does in other organs of the body. As the esophagus is so frequently infected, there is abundant cause for strictures or fibrosis to occur in any part.

Texas State Journal of Medicine, Fort Worth

89:617-680 (Feb.) 1933

Amebiasis. J. P. Simonds, Chicago.—p. 634.
Jaundice, Its Clinical Significance and Management. L. B. Sheldon, Dallas.—p. 637.
Obstetric Analgesia. A. T. Stewart, Lubbock.—p. 642.
Pelvic Floor Injuries Due to Childbirth. C. B. Sauber, Dallas.—p. 646.
Essentials of Radiology. J. B. Johnson, Galveston.—p. 649.
Some Important Etiologic Factors in Rapid Loss of Vision: Case Reports in Point. B. Woodson, Temple.—p. 662.
Complications Peculiar to Pharyngeal Surgery. R. L. Weeks, Brownsville.—p. 649.
Poisoning Encephalodynia. C. S. Sykes, Galveston.—p. 651.
Visual Studies in Public Schools. J. G. Jones, Dallas.—p. 653.
Value of the County Health Unit in Public Health. D. C. Peterson, Austin.—p. 658.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

40:1-60 (Jan.) 1933

Spinal Tumors: Report of Six Cases. A. J. McLean, Portland, Ore.—p. 1.
Problems in Hydrodynamics of Analgesics in Subarachnoid Field of Man: Discussion of Novocain in Artificial Dural Sacs. G. E. Vohs, Salem, Ore.—p. 16.
Postoperative, Incisional and Recurrent Hernias of Anterior and Lateral Abdominal Wall. A. P. Heinsch, Chicago.—p. 33.
Progressive Change of Myofibromas to Spindle Cell Sarcoma. A. A. Matthews and E. F. Stier, Spokane, Wash.—p. 40.

West Virginia Medical Journal, Charleston

28:49-96 (Feb.) 1933

Anesthesia in West Virginia. E. B. Tucker, Morgantown.—p. 49.
*Artificial Rupture of Membranes as Means of Inducing Labor. M. P. Rucker, Richmond, Va.—p. 54.
Cancer of Rectum. C. C. Madding, Pittsburgh.—p. 57.
Evolution of Psychiatry. E. F. Bauer, Huntington.—p. 60.
Hyperthyroidism. M. H. Porterfield, Martinsburg.—p. 67.
Some Notes on Value of Radiation in Gynecology. W. Neill Jr., Bahimore.—p. 71.
Relation Between the Operating Room and the Laboratory. W. T. Gocke, Charleston.—p. 73.
Spinal Cord Tumor: Report of Case. W. Brumagh, Belpre, Ohio.—p. 75.
Postmortem Cesarean Section. W. E. Hoffman, Charleston.—p. 78.

Artificial Rupture of Membranes as Means of Inducing Labor.—Rucker believes that rupture of the membranes is an efficient means of inducing labor at term and a useful method in certain cases of marginal placenta praevia and toxemias of pregnancy. With a proper technic there seems to be less risk of infection than in uncomplicated spontaneous labors. Apparently there is some risk of a contraction ring developing. The risk to the baby is not great. There is a small chance of the cord prolapsing, especially if the presenting part is not engaged.

Wisconsin Medical Journal, Madison

34:77-152 (Feb.) 1933

Prevention of Surgical Complications. E. S. Judd and G. W. Waldron, Rochester, Minn.—p. 87.
Treatment of Hay Fever by Ionization Method. J. A. Hurlbut, Madison.—p. 93.
Present Status of Arthroplasty. W. R. MacAusland, Boston.—p. 95.
Some Everyday Problems in Diagnosis and Treatment of Cancer. E. Fischel, St. Louis.—p. 100.
Summary of Causes of Anemia with Fundamentals Concerning Treatment. H. Z. Giffin, Rochester, Minn.—p. 106.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Physical Medicine, London

9:177-200 (Feb.) 1933

Occupational Therapy as Practiced in Children's Hospitals for Surgical Tuberculosis. H. Gauvain.—p. 179.
The Debilitated Child. W. E. Snell.—p. 181.
The Aged Child: Some Points in Prophylaxis from Physical Treatment Point of View. J. Mennell.—p. 183.
Prevention of Rheumatism in Young Children. J. F. H. Dally.—p. 185.
Nasal Catarrh in Children. A. L. Yates.—p. 187.
Physical Treatment of Paralysis in Children. R. G. Gordon and M. F. Brown.—p. 189.
Treatment of Fractures of Limbs in Children. F. D. Sauer.—p. 192.

British Journal of Surgery, Bristol

20:463-630 (Jan.) 1933

*Etiology of Vascular Symptoms of Cervical Rib. D. M. Blair, F. Davies and W. McKinnon.—p. 486.
Diffuse Intradoct Carcinoma of Breast. E. H. Lepper and A. H. Baber.—p. 415.
Serial Radiographic Appearances of Neuropathic Shoulder Joint. J. F. Brailsford.—p. 424.
*Renal-Adrenal Adherence. T. B. Davie.—p. 428.
Collective Inquiry by the Fellows of the Association of Surgeons into Gastrojejunal Ulceration. G. Wright.—p. 433.
Chronic Interstitial Mastitis. F. d'Abreu.—p. 456.
*Interstitial Radium Treatment of Carcinoma of Breast: Description of Radical Technic. R. G. Hutchison.—p. 465.
Diaphragmatic Hernia. T. Dunhill.—p. 475.
Congenital Hernia Through Right Dome of Diaphragm. F. Forty.—p. 500.
Intestinal Herniation Through a Mesenteric Hiatus. E. S. J. King.—p. 504.
Dyschondroplasia (Ollier's Disease): Report of Case. D. Hunter and P. Wiles.—p. 507.
Colostomy. W. B. Gabriel and O. V. Lloyd-Davies.—p. 530.
Adenoma of Pituitary, with Especial Reference to Pituitary Basophilism of Cushing. W. Sussman.—p. 539.
Perforation of Carcinoma of Stomach into General Peritoneal Cavity. I. Aird.—p. 545.
Bilateral Bipartite Patellae. R. George.—p. 555.

Etiology of Vascular Symptoms of Cervical Rib.—Blair and his co-workers examined histologically the brachial plexus from a case of cervical rib in which the vascular affects were pronounced. They agree with the view of Telford and Stopford that the clinical picture in these cases is one of irritation of the sympathetic (vasoconstrictor) fibers passing to the distal arteries of the upper limb, and not one of paralysis of sympathetic fibers, as other observers thought. In their case the rapid return of pulsation in the radial, ulnar and brachial arteries after operation signifies that thrombosis had not supervened on the arterial spasm. The increased tension of the arterial walls and the diminution of their lumen had alone been sufficient to render pulsation undetectable. That pulsation in these arteries, however, did not return immediately to normal on removal of the cervical rib and the incomplete disappearance of pain after this operation suggest that the irritation of the sympathetic fibers is not due merely to mechanical pressure of the rib but that a chronic aseptic inflammatory lesion in the nerves immediately related to the rib is produced by the pressure irritation. The thickening of the endoneurium and the proliferation of endoneurial nuclei observed by the authors in the lower trunk of the brachial plexus (particularly in its inferior part) and in the distal part of the first dorsal nerve, where it came into immediate relation with the cervical rib, appear to them to be of special significance. They interpret these histologic observations as evidence of irritation by the rib in the immediately related nerves. The collection of nerve fibers (largely unmyelinated) which, for a distance of one-fourth inch, had a separate existence in the inferior part of the lower trunk of the plexus, cannot be considered an unjoined ramus as Telford and Stopford claim for the separate bundle of unmyelinated fibers. In the present specimen the number of unmyelinated fibers in this collection forms only an extremely small fraction of the total number of unmyelinated fibers in the lower trunk of the plexus, and it is difficult to believe that irritation of these few unmyelinated fibers can be responsible for such widespread arterial spasm as was present. The fact that only the lower trunk and the first dorsal nerve showed

histologic evidence of proliferation of endoneurium and endoneurial nuclei and the authors' interpretation that this lesion was responsible for the widespread irritative effects on the sympathetic vasoconstrictor fibers to the vessels of the limb implies that a large proportion of the vasoconstrictor unmyelinated fibers enter the limb by way of the lower trunk or that these fibers in the lower trunk of the plexus have a particularly widespread distribution to the arteries of the limb. Unmyelinated fibers in general are more numerous in the lower trunk. The authors are unable to give any information as to whether the nerves on the under aspect of the subclavian artery, derived from the sympathetic chain and from the ansa subclavia, were in any way affected. The lesion affected principally the unmyelinated vasoconstrictor fibers in the inferior part of the plexus. There was no anatomic segregation of the unmyelinated fibers which would explain their special involvement. It is desirable that operative treatment, whether removal of the cervical rib or division of the scalenus anterior muscle allowing the rib to droop, should be undertaken as early as possible to relieve the plexus from harmful pressure.

Renal-Adrenal Adherences.—In the course of the routine performance of approximately 1,500 postmortem examinations, Davie has on six occasions observed a degree of bilateral renal-adrenal adherence which would have rendered impossible the removal of the kidney without the coincident removal, or serious laceration, of the adrenal. In all these cases (adults) the small amount of loose connective and fatty tissue that usually separates the anterosuperior surface of the kidney from the posteroinferior aspect of the superposed adrenal was absent in whole or in part. In some of the cases the lower portion of the adrenal was thinned out and applied closely to the upper third of the anterior surface of the kidney, and section showed either complete absence of any capsular connective tissue between the two organs or else the presence of only a single attenuated layer of fibrous tissue separating the two organs and serving as a capsule for both. No other forms of developmental abnormalities were present. In particular, in none were there macroscopic evidences of adrenal rests within the renal parenchyma, nor were any of these rests discovered in the considerable number of sections cut for histologic examination. No ectopic adrenal fragments were found.

Interstitial Radium Treatment of Carcinoma of Breast.—Hutchison describes an interstitial radium technic for carcinoma of the breast that he believes is sound in principle, safe in practice and is claimed to be a radical radium implantation, the main features of which are the following: According to the size of the breast one or more layers of needles are inserted from the medial and lateral sides, in such a way that the needles of the deepest layer, undercutting the breast, do not meet in the center and that any subsequent more superficial layers approximate gradually more closely until the effect achieved is that of a cone of radioactive foci with a central zone adequately irradiated but not containing actual needles. The peripheral ends of the needles are crossed at the base of the cone, and occasionally in the subareolar area one or more needles are inserted at an angle of 90 degrees to the deeper planes to close the apex of the cone. Such peripheralization of radium foci avoids the high central intensity, falling rapidly toward the periphery, inevitable when any volume of tissue is implanted in a uniform or in a cartwheel manner. The needles used are of a content of 3 mg., active length 4.5 cm., screened by 0.5 mm. of platinum, and of 2 mg., active length 3 cm., with similar filtration. The technic is also given for the irradiation of tumors of the axilla, supraclavicular area and mediastinum. Stereoscopic roentgenograms bear out the contention that it is possible to irradiate the breast and its lymphatic areas in a satisfactory manner. The needles are left in position for seven days as a rule. As experience of distribution of radium foci and of total dosage accumulates, complete disappearance, not only of the tumor mass but also of glandular deposits, becomes more and more frequent. There appears to be an optimal dosage at which even the largest primary and secondary masses, provided the tumors are of the sensitive type, undergo complete resolution, leaving no trace of their presence. The radical technic, as described, has been employed only throughout 1933. It is therefore not possible to speak of its results from a statistical standpoint. The immediate results, however, are encouraging. The proportion of cases in which disappearance of the primary growth and of its secondaries takes place without leaving any palpable residue is definitely increasing. Up to October 1933 the method was used in twenty-three cases; fourteen of the patients are alive and well, six are alive with evidence of disease, which may yet be amenable to further treatment, and three are dead.

British Medical Journal, London

2: 239-288 (Feb. 9) 1935

Clinical Science and Ophthalmology. A. H. Ramsay.—p. 239.
Etiology of Puerperal Infection, with Especial Reference to Droplet Infection. C. G. Paine.—p. 243.
*Concentrated Liver Extract for Parenteral Administration in Pernicious Anemia. E. F. Scowen and A. W. Spence.—p. 246.
Retrograde Jejunogastric Intussusception, Acute and Chronic. A. W. Adams.—p. 248.
Retrograde Intussusception of Jejunum Following Gastrojejunostomy. R. E. Dobson.—p. 250.
Problems of the Climacteric. J. Whitridge.—p. 251.

Concentrated Liver Extract for Parenteral Administration in Pernicious Anemia.—Scowen and Spence used a liver extract in six patients having pernicious anemia which overcomes the disadvantages of cost and frequent injection. The preparation is a protein-free aqueous extract of liver, 1 cc. being extracted from 25 Gm. of liver and equivalent in activity from thirty to 100 times this weight of fresh liver by mouth. Only one intramuscular injection of from 5 to 10 cc. is necessary to bring about marked clinical improvement and to raise the blood count to the normal level. Maintenance doses of 5 cc. are required only at intervals of one or two months. On the third or fourth day after the initial injection the patients experienced a return of strength and a sense of well being. This often preceded, but sometimes coincided with, the beginning of the reticulocyte response. Reticulocytosis usually started on the third or fourth day and rose to a maximum on the fifth or sixth. In three cases the maximal response did not rise above 15 per cent. The degree of reticulocytosis bore no relation to the eventual rise of red cells. A reticulocyte rise was not observed after subsequent injections. If the initial dose of the liver extract was adequate, the red cells and hemoglobin increased steadily after a single injection, to reach a normal figure in four or five weeks. Two patients, however, who received an initial dose of 5 cc. failed to touch a normal level until a second dose was given. As a rule, an initial dose of 8 cc. of the preparation appears to be adequate, but in severe cases a dose of 10 cc. is desirable. The interval between maintenance doses varies not only from patient to patient but in each individual from time to time. A blood count should be done every two weeks, and any indication of a fall calls for a further injection.

Edinburgh Medical Journal

42: 49-100 (Feb.) 1935

*Heredity in Cancer and Its Value as an Aid in Early Diagnosis. Madge Thurlow Macklin.—p. 49.
Studies in the Nephrotic Syndrome. D. M. Lyon and D. M. Dunlop.—p. 68.

Heredity in Cancer.—Macklin asserts that cancer (covering all tumors, benign or malignant) is due to an inherited factor; in other words, it is hereditary. One cannot say that it is a mere predisposition that is inherited, for that means that a precipitating cause must always be present, and there are numerous records in which there is no evidence of a precipitating cause. Cancer cannot be ascribed to chronic irritation as the sole cause, for such injury is not always followed by cancer and cancer is not always preceded by such injury. Cancer is not an entity any more than infectious diseases are an entity. Cancer of a specific type in a specific organ at a specific age tends to occur in families. When viewed in this light, it is evident that cancer is not so frequent that it is to be expected in several members of a family on the basis of chance alone. In a series of families selected merely because two members in the family had died of the same type of tumor, the author observed that related persons were affected ten times as often as unrelated persons. Related persons were represented by parents and children or by brothers and sisters; unrelated persons were represented by husband and wife. The latter class

exemplify the number of times one might expect two people in a family to be affected if cancer were due to chance alone. Chronic irritation when present appears to play a part in accentuating the speed of a reaction that was destined to occur at a later date. Sometimes the reaction would have been so long delayed past the normal span of life that the chronic irritation assumes the part of the sole etiologic agent, for practical purposes. In other cases it plays no part whatever. Identical twins who have the same type of tumor in the same organ and frequently at the same age afford excellent proof of the part that inheritance plays in the production of cancer. Belief in the inheritance of cancer offers opportunity for early diagnosis. No one patient can be periodically examined for all the types of tumor that may occur. They can be examined periodically for the type or types of tumor that are most common to the other members of their family.

Journal of Physiology, London

80: 251-352 (Feb. 9) 1933

Effect of Choline on Liver Fat of Rats in Various States of Nutrition. C. H. Best and M. Ellezer Hartmann.—p. 253.
Choline and Liver Fat in Phosphorus Poisoning. C. H. Best, D. L. Maclean and Jessie H. Ridout.—p. 275.
Comparative Study of Effects of Adding Different Sugars to Perfusion Fluid Through Frog's Heart and Influence of Insulin Over It. R. E. Fitz and S. Freud.—p. 303.
Pressure in Vagus of Fibers Transmitting Impulses Augmenting Frequency of Respiration. M. Hammouda and W. H. Wilson.—p. 292.
Muscular Work in Dogs Submitted to Different Conditions of Cardiac and Splanchnic Innervations. A. Simonet.—p. 313.
Antagonistic Cardiac Nerves and Heart Rate. A. Samaan.—p. 332.
Inhibition of Water Diuresis by Afferent Nerve Stimuli After Complete Denervation of Kidney. G. W. Thorbald and K. B. Verney.—p. 341.
Measurement of Red Cell Volume: VI. Different Fragility of Red Cells of Various Mammals. E. Fender.—p. 352.
Excitation and Inhibition in Retina and in Optic Nerve. R. Granit and F. O. Thorson.—p. 359.

Journal of Tropical Medicine and Hygiene, London

36: 29-40 (Feb. 1) 1933

Tropical Aphthae or Sprue, and Its Treatment. G. E. Brooke.—p. 29.
Diphtheroids in South Africa and Basutoland. F. G. Cawston.—p. 34.

Lancet, London

1: 337-344 (Jan. 28) 1933

Surgery of Spinal Tumors. L. Rogers.—p. 337.
Biologic Problems in Chemotherapy. W. Yorke and P. Murgatroyd.—p. 191.
*Postural Hypotension: Report of Case. W. P. Croll and R. J. Duthie, note by J. A. MacWilliam.—p. 194.
Prostatic and Gastric Uremia: Notes. J. A. Ryle.—p. 196.
Observations on Treatment of Burns. A. M. Clark and R. Cruickshank.—p. 201.

Postural Hypotension.—Croll and Duthie state that, while only eighteen cases of postural hypotension have been recorded, many cases may have escaped detection through failure to ascertain the blood pressure in the erect as well as in the supine posture. Giddiness on suddenly assuming the standing from the sitting or recumbent position is not uncommon and may be due to the curious failure of the blood pressure to adjust itself to the altered position found in postural hypotension. The authors present the case of a man, aged 37, otherwise apparently normal from the cardiovascular standpoint, whose blood pressure showed remarkable variations with change of posture, a marked fall of pressure accompanied by giddiness invariably taking place when the patient changed from the supine to the standing posture. The fall of pressure was associated with a decrease in the water excretory function of the kidneys. The pulse rate showed a normal response to the change of posture. Abdominal compression, the application of tourniquets round the limbs and the administration of epinephrine, solution of pituitary and histamine alike failed to prevent the fall of pressure taking place.

Medical Journal of Australia, Sydney

2: 37-74 (Jan. 12) 1933

An Address. G. Weigall.—p. 37.
Tuberculous Meningitis in the Adult, with Especial Reference to Mechanism of Symptoms. A. S. Walker.—p. 45.
Attempt to Propagate Poliomyelitis Virus in Developing Egg. F. M. Burnet.—p. 64.
Gonarthritis. D. I. Fitzpatrick.—p. 68.
Relationship of Allergy to Autonomic Nervous System. S. Pers.—p. 69.

Annales des Maladies Vénériennes, Paris

28: 81-160 (Feb.) 1933

Rapid Treatment of Gonorrhea. H. Hoche.—p. 81.
*Rôle of Trichomonas Vaginalis in Development of Vaginitis: Treatment. D. Bykhovsky and M. Gouchansky.—p. 92.

Trichomonas Vaginalis in Vaginitis.—Bykhovsky and Gouchansky found trichomonas in 52 per cent of their patients who had purulent vaginitis. Trichomonas vaginitis shows a typical clinical picture but may sometimes simulate gonorrhea. It is characterized by a chronic course and a tendency to relapse. According to their observations, the most stable results are obtained by applying a combined treatment of mercuric chloride and lactic acid and prolonging the duration of treatment. Symbiosis of trichomonas and gonococci is common and must always be considered a possibility. In such cases antitrichomonas therapy aggravates the course of the gonococcic process. They believe that at least one if not the only method of infection is by coitus. The cases definitely of this origin confirm the pathogenic power of trichomonas.

Archivo Italiano di Chirurgia, Bologna

30: 1-116 (Jan.) 1933

Postoperative Humoral Variations: Modifications of Refractive Index. F. Cammelli.—p. 1.
Ossification in Postoperative Scars: Etiopathogenesis. P. Ljungo.—p. 29.
*Hypercholesterolia in Pathogenesis of Hepatic Calculi. G. M. Giuliani.—p. 61.
Operation of Crural Hernia by Inguinal Route: Late Results. B. Hornberg.—p. 91.

Hypercholesterolia in Pathogenesis of Hepatic Calculi.—Giuliani says that excess of cholesterol in the bile of the gallbladder is the determining factor of cholelithiasis. His statement is supported by chemical, clinicochemical and experimental research. The concentration of cholesterol in the bile of the strawberry gallbladders, removed by cholecystectomy and chemically studied by the author, reached 8 per thousand and 11 per thousand, respectively, in comparison with the normal concentration. The concentration of cholesterol in the bile, obtained by duodenal sounding six or seven years after cholecystectomy in the same patients, reached only 1 per thousand. Experimental stasis of the gallbladder was produced in dogs by means of fixation of the gallbladder to the duodenum. It resulted in the development of a strawberry gallbladder, formation of calculi and increase of the cholesterol in the bile of the gallbladder. The formation of calculi, the development of a strawberry gallbladder and hypercholesterolia were obtained in dogs by the introduction of culture broth of colon bacillus in the gallbladder, both when the organ was left in its place and when, after the introduction of the broth, it was fixed to the duodenum. The author concludes that biliary stasis and infection are the local causal factors of hypercholesterolia in which the strawberry gallbladder and cholelithiasis originate, and that cholecystectomy is the proper treatment of cholecystitis with or without calculi.

Brazil-Medico, Rio de Janeiro

46: 45-66 (Jan. 19) 1933

Vitamin B and Thyroid. F. A. de Moura Campos.—p. 45.
*Biliary Giardiasis. A. Balzac.—p. 47.

Biliary Giardiasis.—Balzac discusses the rôle of Giardia intestinalis in the pathology of the biliary tract. His studies are based on the observation of nineteen cases. He regards Giardia intestinalis as the direct agent of the inflammation of the gallbladder commonly associated with the infestation. The author describes three clinical forms of biliary giardiasis: (1) the gastrocystic form, characterized by cramps of the stomach and by clinical and objective symptoms similar to those of duodenal ulcer; (2) the pseudolithiasic form, which includes the pseudocholelithiasic and the pseudonephrolithiasic types, and (3) the cardiac form, which includes the arrhythmic and the anginal types. The different syndromes produced by the infestation originate in a chronic catarrhal cholecystitis of the simple or the exfoliative type. The most frequent complications of the infestation are hepatic cholangiolitis, secondary to chronic cholecystitis and suppurative cholecystitis caused by pyogenic associated bacteria. As the infestation has been found only among persons living in certain rural centers, it is advisable

to examine the feces periodically, after the administration of an effective purgative, for the detection of carriers who should be isolated and treated. The treatment consists in draining the duodenal and the cholecystic bile, after which intravenous injections of neoarsphenamine are given. This treatment is given at intervals of one week but is discontinued after the parasite in the bile has completely disappeared. To prevent a recurrence, it is advisable to give the patient one or two tablets of acetarsone on an empty stomach in the morning for several months. The tablets are given for five consecutive days, with intervals of three days of rest. By this treatment the permanent disappearance of the parasite from the bile is obtained.

Prensa Médica Argentina, Buenos Aires

XXII: 239-488 (Feb. 20) 1935

*Connective Tissue Tumors of Giant Cell Type. F. R. Rois and R. A. Rossi.—p. 259.
Acute Meningitis of Infectious Origin: Cases. T. Mainetti, R. Tamoso and I. Aller.—p. 292.
Mesenchymoblastomas of Aorgus Lobules. A. J. Roy and J. C. Roy.—p. 401.

Connective Tissue Tumors of Giant Cell Type.—Rois and Rossi say that connective tissue tumors of the giant cell type are relatively benign, do not give metastasis and, if properly removed, do not recur. Their recidivation is slightly more frequent than that of benign tumors. They should not be designated as sarcomas, because the latter are often highly malignant while the former are not. The designation of gigantocellular sarcoids is preferable. Gigantocellular sarcoids may complicate a preexisting fibrous osteitis. The stroma is of typical fibroblastic cells, and in certain cases of irritability it changes to a hemangio-endotheliomatous type. The giant cells of these tumors are plasmodia *sui generis* with the typical characteristics of the giant cell of reaction against foreign bodies. They are entirely different from myeloplaxes and osteoclasts, on the one hand, and from the large cells (improperly called giant cells) of true sarcoma, on the other. They originate in the confluence of endothelial cells, do not form vessels, and constitute the limits of lacunar spaces. The tumors are highly vascular, with a predominance of the lacunar over the capillary vascularization. There are frequent foci of hemorrhages and of hematic pigments. Predisposition and trauma seem to be the etiologic factors. The characteristics of the giant cells and stroma of these tumors seem to indicate their inflammatory origin.

Deutsche medizinische Wochenschrift, Leipzig

61: 201-344 (Feb. 8) 1935. Partial Index

Newer Methods of Electrocardiography in Human Subjects. W. Trendelenburg.—p. 201.
*Spontaneous Hypoglycemia as Transitory Symptom. Unverricht.—p. 207.
Temporary Disturbances of Cardiac Conduction (Partial Auriculoventricular Block). L. Spurng.—p. 209.
*Sensitivity to Epinephrine and Vulvular Lesions. D. Gross.—p. 219.

Spontaneous Hypoglycemia as Transitory Symptom.—Unverricht states that patients with spontaneous hypoglycemia often show no organic changes. In the hope of detecting a definite syndrome that would permit the diagnosis of spontaneous hypoglycemia in general practice, he subjected patients with spontaneous hypoglycemia to dextrose tolerance tests, to starvation and to physical exertion. He detected varying symptoms, but a definite syndrome could not be found. The only manifestation that all had in common was a feeling of weakness and somnolence. They were easily fatigued, had a deficient concentration capacity, felt depressed and complained of pressure in the head, faintness, excessive sweating, eructation, vascular spasms, oppression of the heart, irritability, spasm in the region of the gallbladder and hyperacidity. The patients presented one or several of these symptoms. An unprepared examination of the blood sugar generally revealed nothing abnormal, but, after a twelve or twenty-four hour fast, after a dextrose tolerance test or after physical exertions, great reductions in the blood sugar became evident and occasionally tremor, chills, excessive perspiration and accelerated pulsation developed. All these patients with transitory hypoglycemia had the urge to eat frequently and showed a preference for sweets and alcohol. The origin of transitory hypoglycemia is not clearly understood as yet, but on the basis of its manifestations the author is inclined to believe that it results from a disturbance in the correlation of the various endocrine and nervous factors. The chief cause is probably an increased excretion of insulin, which in turn is caused either by disease of the islands of Langerhans or by their irritation by extra-insular factors. In three cases observed by the author, the spontaneous hypoglycemia represented a phase of prediabetes, because the loss of equilibrium in the carbohydrate metabolism resulted in fluctuations toward both sides. He observed also that some cases of hypoglycemia are caused by hepatic disturbances, but not all patients had disorders of the liver.

Sensitivity to Epinephrine and Valvular Lesions.—Gross determined alterations in the equilibrium of the sympathetic nervous system in patients with valvular lesions of the heart by testing the sensitivity for epinephrine. He observed sympathicotonia in valvular insufficiency and vagotonia in valvular stenosis.

Deutsche Zeitschrift für Chirurgie, Berlin

244: 465-670 (Jan. 22) 1935

*Fractures of the Femur. H. von Brücke.—p. 465.
Use of Rust Free Nails in Treatment of Fractures. O. Hilgenfeldt.—p. 433.
Treatment of Pseudarthrosis of Long Bone by Surrounding It with a Rib Transplant. F. Bruner.—p. 445.
Isolated Syphilis of Patella. H. R. Pass.—p. 452.
Appendicitis and Unspecific Inflammatory Tumors of Ileocecal Region. T. Stratton.—p. 457.
Tumor Forming Tuberculosis of Spleen. S. Feuerstein.—p. 463.

Fractures of the Femur.—Von Brücke reports the results obtained in 327 cases of fracture of the femur treated between 1922 and 1931 in the surgical clinic of Egon Ranzi in Vienna. Of these, 12 per cent were pathologic fractures. In one case of osteitis fibrosa cystica generalisata, fracture of both femurs healed on the removal of an adenoma of a parathyroid gland. The predisposition to the pathologic fractures of the area immediately below the lesser trochanter was demonstrated experimentally to be due to the fact that this area constitutes the weakest part of the femur. The treatment consisted mainly of extension with secondary manual reduction of the fragments. Operation was performed in 2.5 per cent of the cases. In recent years the operative treatment as well as the primary plaster cast has been given up more and more in favor of the extension method of treatment. The mortality amounted to 13.8 per cent. Only one case of pseudarthrosis was observed in a woman, aged 60. The results of treatment were excellent or satisfactory in 90 per cent and unsatisfactory or bad in 10 per cent. The average shortening of the limb amounted to 0.87 cm. and the average flexion of the knee to 54 degrees. The author considers the primary plaster cast and the operative intervention the principal causes of bad results. The principal difficulty in the treatment is the avoidance of injury to the knee joint. Such injuries are caused not so much by the extension as by the plaster-cast immobilization. To prevent limitations of movements of the knee joint the author recommends that the extension be kept up as long as possible and that the knee be handled with the greatest care on the removal of the cast.

Deutsches Archiv für klinische Medizin, Berlin

177: 289-344 (Feb. 6) 1935. Partial Index

Red Blood Picture in Diseases of Liver. R. Nishmura.—p. 289.
*Practicability of Gastrography in Diagnosis. E. Kolta and A. Scholtz.—p. 324.
Gallstone Formation Before the Age of 30. G. Lennel.—p. 262.
*Vomiting of Blood in Organic Diseases of Nerves. G. Bodechtel.—p. 265.
*How to Explain the Rapid Course of Acute Endocarditis Caused by Streptococcus Viridans Compared to Endocarditis Lenta. Gertrude Schwalbe.—p. 283.

Gastrography in Diagnosis.—Kolta and Scholtz were able to demonstrate by means of gastrography that in diseases of the biliary tract the gastric contractions increase following the ingestion of butter, while in other disturbances, such as ulcer and catarrh, the movements of the stomach cease entirely. This is helpful in the differentiation of the two groups of disorders.

Vomiting of Blood in Organic Diseases of Nerves.—Bodechtel points out that a report by Cushing, in which that author calls attention to the appearance of peritoneal symptoms

following operations for cerebellar tumors and the successful detection of new and perforated gastric ulcers in such patients, directed his attention to similar cases observed by him. After pointing out that Russian authors made similar observations on the basis of animal experiments conducted in 1923 (entirely independent of Cushing's studies), Bodechtel gives the histories of a number of cases that he observed. He thinks that the changes in the so-called sympathetic cell groups of the spinal cord and of the brain stem, which he observed in two of his patients, might be of especial interest since they present a proof for the hypothesis of the existence of a connection between the diencephalon and the visceral nucleus of the medulla oblongata. The impairment of these connecting tracts may elicit sympathetic disturbances in the same manner as a lesion of the sympathetic centers in the diencephalon and the medulla oblongata.

Acute Endocarditis and Endocarditis Lenta.—Schwalbe stresses the differences between acute endocarditis caused by Streptococcus viridans and endocarditis lenta. Since former studies on this problem disclosed no difference in the type and the virulence of the various strains, it is necessary to find other factors that cause a fulminant course although the pathogenic organism is not highly virulent. The author thinks that the severe lesions of the heart and the congenital or acquired valvular lesions should be given first consideration. She admits that in some instances the defect may become so rapidly decompensated that death follows quickly as a result of it. However, in the majority of cases of acute endocarditis that is not the case. On the contrary, the severity of the infection usually causes the fatal outcome. On the other hand, superinfections may bring on a turn for the worse, such as pneumonia, meningitis, uremia or the existence of an old tuberculosis. Moreover, the patient's general condition should not be disregarded. An undernourished body and one that has been exhausted by cares and excitement is hardly capable of mobilizing the necessary defense powers. To be sure, this factor is probably rarely of significance in the case of a fulminant course. The author points out that her theories about the cause of acute endocarditis viridans are essentially the same as those expressed by Schottmüller. Since the cases in question form exceptions to the aspects of the typical picture of endocarditis, it is to be assumed that the virulent conditions have been shifted; that is, as a result of reduced defense power and impairment of the heart the organism is not equal to the increased requirements.

Jahrbuch für Kinderheilkunde, Berlin

144: 63-126 (Feb.) 1938

*Influence of Antirachitic Therapy on Electrocardiogram of Children. W. Uhse.—p. 63.

*Quantity of Blood During Collapse in Alimentary Intoxication of Nurslings. H. Seckel.—p. 81.

Studies on Psyche of Mongolian Idiots. Margret Kohnhorst.—p. 87.

Influence of Viosterol on Electrocardiogram.—Uhse points out that, in addition to the therapeutic effects, viosterol also exerts a toxic influence, and he substantiates this by reviewing the literature and by his own observations. In all, he examined eighty-two children. The first group of twenty-one children had been treated with a viosterol milk of which 0.5 liter contained approximately three drops of standardized viosterol in oil. In all these children the treatment had the desired antirachitic effect, but seventeen of them showed an abnormal electrocardiogram. A second group of sixteen children was treated with viosterol in oil, and all but one showed changes in the electrocardiogram. A third group of twenty children was given cod liver oil with viosterol, and disturbances in the electrocardiogram developed in fifteen. The fourth group of eight children was treated with pure cod liver oil, and seven developed electrocardiographic changes. The fifth group of seventeen children was subjected to quartz lamp irradiations, and these showed no changes in the electrocardiograms at the end of the treatment. The electrocardiographic changes that developed in the first four groups were nearly always in the final wave; that is, in the part that begins with S and ends after T. The question of whether there is a connection between the dosage of viosterol and the pathologic manifestations in the electrocardiogram is answered by the fact that in the author's cases the minimum doses were given and still the changes developed. The electrocardiographic changes that develop following medication with viosterol largely resemble those which develop after infections, such as scarlet fever myocarditis, in which myocarditic foci are present. Thus it appears possible that medication with viosterol may lead to myocardial impairment. However, while most postinfectious electrocardiographic changes are only transitory, those caused by viosterol are still present from six to nine months later. It is worthy of note that the sensitivity to viosterol decreases with the age of the children. The author observed that nurslings and small children who are less than 2 years old are most likely to develop electrocardiographic changes following treatment with viosterol. Older children and adults are less exposed to this danger. Moreover, children with rickets tolerate viosterol better than those without rickets.

Alimentary Intoxication of Nurslings.—Seckel shows that during alimentary intoxication of nurslings there develops a true circulatory collapse with reduction of the circulatory quantity of the blood. This decrease in the circulating amount of blood is due to inspissation as well as to storage in the depot organs. Both these factors lead to a retardation of the blood stream and to a reduction in the minute and heat volume of the heart. The smaller heat volume of the heart during collapse is indicated by a diminished size of the cardiac shadow in the roentgenogram and by the diminution or the complete disappearance of the first heart sound.

Monatschrift f. Geburtshilfe u. Gynäkologie, Berlin

108: 321-380 (Feb.) 1938

*Surgical or Ray Treatment of Myoma? H. Guthmann and W. Atzert.—p. 321.

Genital Hemorrhage of the New-Born as Birth Trauma. E. Klaften and R. Wagner.—p. 340.

Progress of Gynecologic Hormone Therapy. H. Brattisch.—p. 344.

*Treatment of Suppurating Tumors of Adnexa. S. S. Barjaktarović.—p. 352.

Treatment of Myomas.—Studies of 501 cases convinced Guthmann and Atzert that the results of surgical treatment and of ray therapy are approximately the same if the effect of the total roentgen menolipsination is compared with the total extirpation of the uterus, and if the effect of temporary menolipsination is compared with partial extirpation. The disturbances that develop as sequels of the treatment of myoma are about the same with the two methods of treatment. The symptoms of abolished function, for instance, appear with about the same frequency after total roentgen menolipsination as after total hysterectomy with the removal of both ovaries (in about 87 per cent of the cases). The preservation of one ovary produced a more favorable result, since the symptoms of abolished function appeared in only 63 per cent of these cases. But even in enucleation of the myomas, in which the genital function is not interfered with, symptoms of abolished function are present in 23.5 per cent of the cases. This indicates that the psychic factors play an important part. The increase in weight was about the same in all types of treatment, as regards the incidence as well as the degree of increase. Cohabitation was impeded by processes of involution in about 14 per cent of the cases after irradiation as well as after surgical treatment. These and other observations convinced the authors that the treatment of myoma should be individualized. In determining the best therapeutic methods the following factors should be considered: (1) the type of myoma (subserous, intramural, submucous, intraligamentary), (2) the complications, (3) the age of the woman, (4) the preservation of the menstruation and the conception capacity, (5) secretory disturbances and (6) nervous disturbances.

Treatment of Suppurating Tumors of Adnexa.—Barjaktarović treats suppurating tumors of the adnexa in the following manner: After a thorough irrigation with antiseptic solutions, the vagina is dilated by dearteurs. The lower lip of the uterine cervix is grasped with a mouse tooth forceps and is drawn, horizontally and slightly upward, to the vaginal opening. In this manner, the posterior vaginal vault is completely exposed and easily accessible. Then the upper vaginal dearteur is removed and the posterior vaginal vault is isolated and dried. If the cervix is drawn forward horizontally, a bend is formed in the vaginal vault that corresponds to Douglas' pouch. The puncture is made in this bend. The needle should be parallel to the uterus. This is especially important, if only a portion of

the tumor has entered the Douglas pouch. After the needle has reached Douglas' cavity, it is directed toward the right or the left to reach the tumor. In the event that the tumor is located high up, an assistant has to exert pressure on the abdomen in order to press the tumor down into Douglas' pouch. After the tumor has been punctured with the needle, the pus is pumped out and a 2 or 3:1,000 solution of ethoxydiamino-acridine lactate is introduced and then withdrawn again. The quantity of the solution should be the same as that of the pus which has been removed. The solution is introduced and removed several times until it returns clear. As a rule, the third irrigation yields clear fluid. The author employed this method in 137 cases of suppurating tumors of the adnexa. In the majority of cases, complete cure was effected; in the others, improvement was obtained.

Münchener medizinische Wochenschrift, Munich

82: 343-382 (Feb. 14) 1935. Partial Index

Therapy of Epicondylitis of the Humerus. H. Fleiner.—p. 346.
Significance of Occupational and Sport Injuries in Dupuytren's Contracture. O. Schneider.—p. 348.
How to Test Function of Auditory Tube, Particularly for Purposes of Examination of Aviators. F. Zöllner.—p. 349.
*Modified Takata Reaction in Liver Disease. Lilly Rappolt.—p. 353.
*Simple Ulcer of Cecum. W. Thaler.—p. 355.
*Hypersensitivity of Skin to Balsam of Peru. W. Engelhardt.—p. 356.

Takata Reaction in Liver Diseases.—In reviewing the history of the Takata reaction, Rappolt points out that Jesler and Staub employed it first on the serum of patients with hepatic disturbances. She describes the results obtained with the test on 348 patients with suspected hepatic disorders. Of the patients in whom cirrhosis of the liver was certain, 85 per cent had a positive Takata reaction. In patients with chronic alcoholism and cirrhosis, however, the reaction was usually negative. In icterus and other hepatic disorders, 20 per cent gave a positive flocculation reaction, and in all these a considerable damage of the liver could be suspected. Of the patients with various other disturbances, 3.7 per cent had a positive Takata reaction and approximately 75 per cent of these positive cases showed a decompensated circulatory disorder with stasis of the liver. The positive Takata reaction was always accompanied by an increase in the seroglobulin, but there was no absolute parallelism between the outcome of the Takata reaction and the degree of the globulin increase and the sedimentation speed of the erythrocytes. The author concludes that the Takata reaction is a valuable diagnostic aid in differentiating a cirrhosis of the liver from other hepatic disorders.

Simple Ulcer of Cecum Simulating Appendicitis.—Thaler gives the history of a woman, aged 30, who complained of symptoms indicative of appendicitis. The operation revealed that the appendix was normal, but inspection of the cecum disclosed a simple ulcer the size of a hen's egg. An ileocecal resection was done and the postoperative course was at first uneventful, but later peritonitis developed and the woman died. A review of the literature disclosed that a high percentage of patients with cecal ulcer die of perforation peritonitis. The author's aim in reporting this case was to call attention to the fact that cecal ulcers often simulate appendicitis and to stress that, when the appendix is found normal, the colon should be carefully inspected for the presence of ulcer.

Hypersensitivity of Skin to Balsam of Peru.—Engelhardt states that hypersensitivity of the skin to balsam of Peru is present in 2 per cent of persons who have no skin disease and have never used ointments. In patients with skin disease who have used ointments much, hypersensitivity exists in 10 per cent. The hypersensitivity to balsam of Peru is monovalent; that is, tests disclosed no polyvalent sensitization to other eczematous substances and no nonspecific irritability of the skin. All constituents of balsam of Peru are involved in the sensitization, for they all produce positive hypersensitivity reactions. In view of the high sensitizing power of balsam of Peru, it is inadvisable to treat large wound surfaces, including chronic eczemas, for long periods with balsam of Peru. At any rate, the patch test (Jadassohn-Bloch) should be made whenever extensive application of a preparation containing balsam of Peru is intended.

Zentralblatt für Chirurgie, Leipzig

62: 433-480 (Feb. 23) 1935. Partial Index

Fundamentals in Treatment of Intermaxillary Bone in Bilateral Harelip. E. Feldmann.—p. 434.
Torsion of Pendulous Gallbladder. W. Pursch.—p. 439.
*Transfusion of Human Blood Serum for Control of Bleeding. A. Filatov and N. Kartaševskij.—p. 441.
Operative Intervention for Recurring Hydrops of Knee. F. Mandl.—p. 445.

Transfusion of Serum for Control of Bleeding.—In the modern conception of the therapeutic effect of blood transfusion, the principal rôle, according to Filatov and Kartaševskij, is assigned to the introduction of living erythrocytes in the blood of the recipient, while that of the blood serum has been but little investigated. The authors studied the effect of blood serum transfusion as well as the question of conservation of the serum for the last one and one-half years. The blood of the donor was received in a flask half filled with a preservative (sodium citrate 5, sodium chloride 9, distilled water 1,000). The mixture was kept from three to four days in the icebox and the supernatant serum siphoned off and placed in sterile flasks having a capacity of from 50 to 250 cc. Serum transfusion was practiced in seventy-two cases. The authors conclude that the hemostatic effect of serum transfusion equals that of whole blood transfusion. The serum may be preserved for months, though the exact limit has not been determined. Smaller quantities (from 50 to 150 cc.) of serum are adequate for hemostatic purposes. Because it does not contain agglutinins, the serum from groups A and B may be given any patient without determining his blood group. Further study is required to determine the question of applicability of serum transfusion for the purpose of replacement as well as for its efficiency in manifesting the immunobiologic properties of whole blood transfusion.

Sovetskaya Klinika, Moscow

2: 599-1053 (Nos. 109-112) 1933. Partial Index

*Morphologic Manifestations of Allergic Reactions in Man. A. I. Abrikosov.—p. 619.
*Differential Diagnosis of Spasm and of Occlusion of Coronary Arteries. L. I. Pogorlaa, L. F. Litschev and M. G. Tregubina.—p. 736.
*Rational Classification of Rheumatic Disorders. L. B. Bakhshstch.—p. 765.
*Dyskinesis of Biliary Tracts. E. S. Shakhbazyan.—p. 964.

Morphologic Manifestations of Allergic Reactions.—Abrikosov states that morphologic manifestations of allergic reactions are of two types: (1) new and peculiar alterations in a tissue that hitherto has presented nothing abnormal and (2) alteration of the type of previously existing inflammation. The peculiar alterations in a previously normal tissue are of the nature of hypergergy, best characterized as alterations of the type of Arthus's phenomenon. Here belong changes of the mesenchymal tissue in acute rheumatism, changes of the wall of the vessels in malignant nephrosclerosis, nodous periarteritis and obliterating thrombo-angiitis (Bürger). The hypergergic alterations of the walls of the blood vessels seen in various infectious diseases likewise belong here. The essential feature in all is a peculiar necrobiotic disorganization of the mesenchyma in the form of an initial "fibrinoid swelling" of tissues with consequent inflammatory manifestations and sclerosis. The change in the character of the inflammatory reaction in hypergergy manifests itself in a rapid course and a disproportion to the causative factor. The morphologic changes observed are those of exudation, hemorrhagic manifestations and, not infrequently, circulatory disturbances in the form of stasis. A chronic mild inflammatory process with a predominance of proliferation and a tendency to fibrosis characterizes the anergic reaction. The author calls attention to the fact that a number of allergic reactions manifest themselves in functional rather than morphologic reactions as, for example, the muscular spasm of bronchi in asthma, or the pylorospasm. On the other hand, certain allergic reactions present ordinary alterations without any specific character, such as the manifestations of serum disease, of rhinitis in hay fever, of the alimentary idiosyncrasies and of eczema.

Diagnosis of Occlusion of Coronary Arteries.—Fogelson and his co-workers state that the clinical picture of an attack of angina pectoris does not enable one to diagnose a coronary occlusion in many instances. This question can be

decided, however, by an electrocardiogram. Sclerosis of the coronaries is not necessarily accompanied by spasmodic phenomena. A vascular spasm in the presence of normal nerve plexuses of the adventitia need not cause painful sensations in every instance. Consequently, a coronary occlusion may take place without causing painful sensations and be recognized only in the electrocardiogram. The changes in the electrocardiogram enable one to estimate the magnitude of the involved cardiac segment. The rapidity of return to normal judged from protracted electrocardiographic observations is an indication of the size of the newly formed scar and the establishment of collateral circulation. If the electrocardiogram fails to return to normal, the involved segment is large and has been replaced by a scar. On the other hand, a rapid return to normal indicates that the involved segment of the myocardium is not large, that the sclerotic process in the coronaries is not extensive and that a collateral circulation has been reestablished. The authors conclude that a spasm of the coronary vessels constitutes the cause of an anginal attack and that the spasm may lead to their occlusion. The latter is observed in the majority of instances of sclerosed coronaries. The clinical picture is not always sufficient to enable one to diagnose thrombosis. Severe anginal attacks may pass without coronary occlusion taking place, and on the other hand coronary thrombosis may fail to give rise to a painful syndrome. The determining factor in the differential diagnosis between a spasm and occlusion is the electrocardiogram. Systematic electrocardiographic observations make it possible to estimate the magnitude of the myocardial segment involved, as well as the rapidity of the resolution of the myelomalacial focus.

Classification of Rheumatic Disorders.—Bubbitsch proposes the term "true rheumatism" for a clinical entity the etiology of which has not been completely elucidated but which presents lesions of the connective tissues, particularly of the heart. This lesion is a granulomatous process described by Aschoff and considered an expression of a particular hypergergic condition of the organism. The heart is always affected and therefore constitutes a specific primary factor. The polyarthritis is a secondary factor and, while usually present, may be absent. These truly rheumatic acute polyarthritides seldom pass into a chronic stage. The invalidism that ensues is always cardiac in nature. The clinical characteristic of this disease, according to the author, is a biologic reaction to cooling. The reaction consists in lowering of the leukocyte count when a joint is exposed to the cooling effect of ether. This occurs only in the blood of a "true rheumatic patient" and is absent in other forms of so-called rheumatism. The correctness and constancy of the reaction have been confirmed by observations of various authors on some 300 patients. This reaction enables one to recognize rheumatism in its vascular form, in the absence of joint involvement.

Dyskinesia of Biliary Tracts.—Shabbeiryan states that the diagnosis of dyskinesia of the biliary tracts is difficult. Its recognition is possible only through elimination of other diseases of the biliary tract and of the adjacent abdominal viscera, such as the pancreas, the stomach, the duodenum and the right kidney. The most important clinical methods of investigation are duodenal drainage and cholecystography (normal B bile and normal gallbladder shadow). The average of wrong diagnoses is at least 30 per cent. Surgical therapy for the so-called dyskinetic disturbances of the biliary tracts is poorly founded. The late results of the various procedures, such as cholecystectomy, choledochoduodenostomy or stretching of the sphincter of Oddi, give poor results. The internal medical treatment, as a rule, brings about the desired results.

Hygiea, Stockholm

97: 49-80 (Jan. 31) 1935

Fractures of Forearm in Children. E. Ellberg.—p. 49.

*Erythema Nodosum in Previously Tuberculous Persons, Especially Recurrent Erythema Nodosum: C'en. E. Lossning.—p. 69.

Erythema Nodosum.—Lossning presents thirty cases of erythema nodosum in previously tuberculous persons, mainly adults, analyzing the nineteen cases of recurrent erythema nodosum. He finds, in addition to erythema nodosum due to primary infection, the following main types on a tuberculous basis: 1. Erythema nodosum following infections causing a reversal in allergy, (a) in connection with an exacerbation of the tuberculous process or activation of an older form, or (b) sensitization by unspecific protein substances (bacteria toxins) of a tuberculin positive person, without signs of active tuberculosis. 2. Erythema nodosum on the basis of an exogenous reinfection, the patient passing through a new (somewhat modified?) primary stage, or a superinfection activating the primary focus. 3. Erythema nodosum due to a superinfection, the effect of which is a marked tuberculinization and increase in allergy without signs of active tuberculosis. 4. Erythema nodosum in grave active pulmonary tuberculosis, when an anergic condition due to deficient antibody formation is followed by a spontaneous flaring up of the immune body formation of the organism, with consequent increase in allergy.

Norsk Magasin for Lægevidenskapen, Oslo

96: 121-224 (Feb.) 1935

Supracondylar Fractures of Humerus in Children: Böhler's Treatment. E. Thorgersen.—p. 121.

*Development of Cancer in So-Called Atheromas. E. Hval.—p. 143.

*Sarcoma with Unusual Localization: Three Cases. E. Hval.—p. 153.

Attempt at Cultivation of Melanotic Tumors. G. Goldberg.—p. 169.

*Total Gastrectomy for Cancer with After-Examination of Intestinal Resorption. P. Bull and J. Stang.—p. 185.

*"Spontaneous" Hematoma of Abdominal Wall: Two Cases. K. E. Kaurin.—p. 173.

Investigations on Iron Metabolism in Pregnancy: 1. Iron Content of Our Food. K. U. Tveteraa.—p. 177.

Oldest Description of Bubonic Plague. B. Eldell.—p. 185.

Cancer in So-Called Atheromas.—Hval reports one case of papilloma developed in a retention atheroma and twelve cases in which the atheroma developed into carcinoma. Of the twelve, ten were in women and two in men; all but two of the patients were more than 50 years of age. In ten cases there was squamous epithelial cancer with cancroid pearly formation, one instance with papillomatous structure being regarded as a probable transition form. Relatively marked inflammation was seen in these cases. In two cases the tumor was of certain papillomatous nature, in one there was mucous degeneration, and in both the cell form resembled that in basal cell carcinoma of the skin. The author says that the malignant development occurs in cysts that have been of unchanged size for many years, seems to be slow in all cases, and is relatively benign. Beginning growth of the cysts, suppuration or beginning pain have led to their removal. On excision of painful or suppurating atheromas in older persons the possibility of carcinomatous degeneration should be borne in mind.

Sarcoma with Unusual Localization.—The first case of polymorphic cell sarcoma of the penis in a man aged 63 is attributed to trauma at the site one year earlier. One of the two cases of subungual sarcoma was in a girl of 15, the other in a woodchopper aged 40. Hval says that both cases presented a characteristic history with unusually pronounced pain in the finger; after the lapse of months a not particularly characteristic ulceration appeared. In long-continued earphine the possibility of sarcoma should be considered and histologic examination of a specimen excision made. Treatment must be radical, and favorable results depend largely on early diagnosis.

Total Gastrectomy for Cancer.—In Bull and Stang's case, with large cancer along the upper part of the major curvature up to the cardia, total gastrectomy with retrocolic esophagojejunostomy and jejunojejunostomy was performed in February 1933. The patient was a man, aged 40, in good general condition; there were no large glandular metastases and the intra-abdominal portion of the esophagus was free from cancer and long enough to make it unnecessary to loosen the esophagus from the hiatus in the diaphragm. After-examination in March 1934 revealed that he had begun in full work as a railroad machinist since August 1933 and had gained 7 Kg. He takes from 0.5 to 0.75 Kg. of liver weekly. There was a slight anemia, with an almost normal blood picture. Absorption tests showed a protein loss of 32 per cent, a fat loss of 30.14 per cent and a carbohydrate loss of 1 per cent, the loss of protein and of fat being slightly higher than in normal persons.